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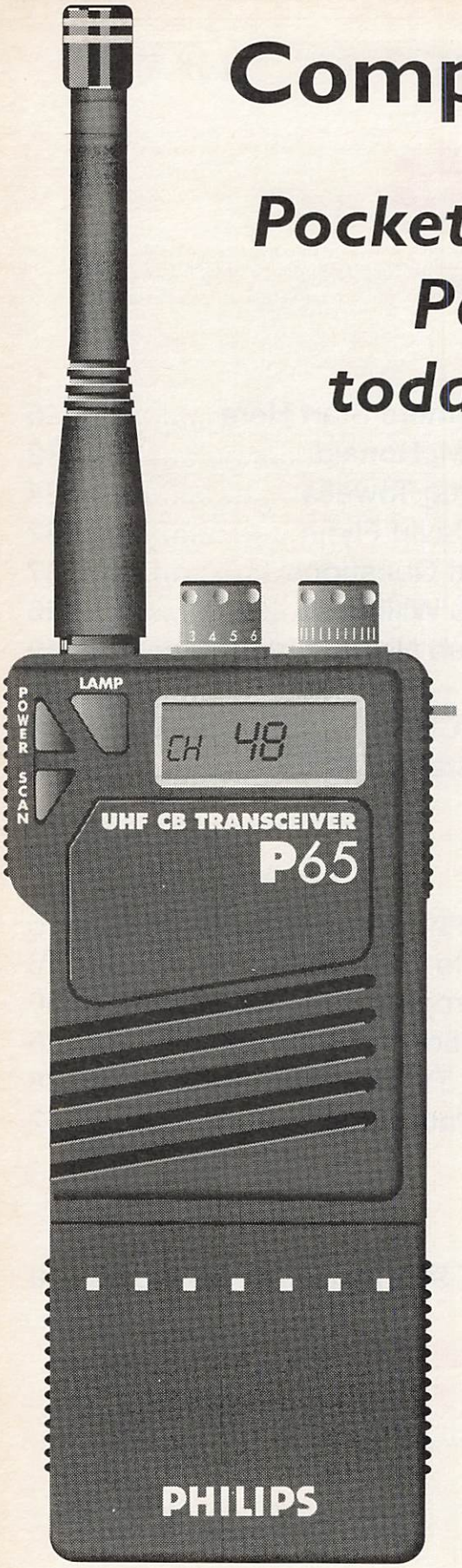

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SCANNING NEWCOMERS START HERE

Scanning is basically the VHF/UHF version of shortwave listening. Whilst there is no special language associated with scanning, there are a few phrases and terms that may confuse the newcomer.

While it is not necessary to understand or even know what these terms mean, it does enhance one's enjoyment of the hobby if you obtain a basic knowledge.

Anyone who purchases a scanner can find out enough information on the basic operation of the receiver from the accompanying handbook or magazines such as CBA.

However, there are a number of words that may not mean a lot to the newcomer, or have significance outside the engrossing hobby of scanning. Unlike other aspects of hobby radio, such as amateur and CB, scanners do not require any licence, either to purchase or operate. Apart from transmissions which are in some way connected to a telephone conversations, scanner enthusiasts are free to monitor whomever they choose.

This page is designed to introduce you, the newcomer to scanning radio receivers.

One of the first things that you will come across are the different types of transmission ***MODES***, such as ***AM*** or Amplitude Modulation...it is found mainly on 27 MHz CB and VHF/UHF aircraft frequencies.

The primary mode encountered, however, is ***FM*** or Frequency Modulation.

FM comes in two types, narrow band, which is for normal two way radio transmissions and wide band which is used for TV audio transmissions and FM broadcast stations.

A portion of the radio spectrum is called a ***BAND.***

Bands are made up of ***MEGAHERTZ*** (usually shown as MHz) and ***KILOHERTZ*** (usually seen as kHz).

As far as the scanner owner is concerned, the main bands are ***VHF*** (Very High Frequency). The VHF band embraces all frequencies between 30 MHz and 300 MHz while frequencies between 300 MHz and 3000 MHz are known as ***UHF*** (Ultra High Frequency). Some scanners can receive ***HF*** (High Frequency) which are the frequencies between 3 MHz and 30 MHz.

There are many type of users through out the spectrum.

AERONAUTICAL MOBILE is for the exclusive use of aircraft and associated services while ***MARITIME MOBILE*** is for the exclusive use of marine craft and associated services. ***LAND MOBILE*** is for services where both stations are terrestrial, or land based.

As the scanner has become more and more sophisticated, other radio bands, such as space to earth, earth to space communications can now be monitored. However, for the main we will stick to the three standard user types.

Many operators in the Land Mobile bands use ***REPEATERS***.

A repeater is a combined receiver (using one frequency) and transmitter (on a second frequency) which retransmits the received signal in real time...this is known as a ***DUPLEX*** system.

Others use ***SIMPLEX*** frequencies.

Simplex is the method in which two way transmissions are made on the same frequency, for transmit as well as receive.

Transmitters (including handheld, mobile and fixed) are rated in ***WATTS***.

A watt is a unit of power and the more watts the better the signal.

Scanners have the ability to ***SEARCH*** out new and interesting frequencies.

An upper and lower frequency is programmed into the receiver and this then seeks out active frequencies within the assigned limits. If there is a frequency that has special status it can be entered into a ***PRIORITY*** channel. The scanner will then sample that channel at regular intervals (programmed by the operator) for activity. This process will overide any other functions being carried out at the time. If a channel is carrying too much traffic or is subject to interference which may cause it to continually open the ***SQUELCH*** control, it can be ***LOCKED OUT*** of the scan sequence.

To open a scanner's microprocessor to receive the frequency data, it is often necessary to press ***PROGRAM***.

By pressing ***MANUAL*** your scanner will advance channel by channel through it's memory banks.

Scanners normally come with an antenna of some description and this is usually either a ***TELESCOPING WHIP*** or ***RUBBER DUCKIE***.

An external aerial can be employed to further enhance the reception.

The most common external antenna is a ***DISCONE***. This is a broadband aerial well suited to most listening applications.

If, however, you live outside built up areas or wish to monitor services well away from your location an ***ACTIVE ANTENNA*** may be the best for you.

An active antenna has a wideband ***RF*** (Radio Frequency) amplifier built into it. It can boost the incoming signal by as much as 20 dB (decibels) in gain. The higher the gain of the antenna the better the received signal.

A glance at most scanner handbooks will reveal words like ***SENSITIVITY*** and ***SELECTIVITY***.

Sensitivity is the minimum usable input required to activate the receiver. It is usually expressed as a decimal of a microvolt (0.2 microV or 1.0 microV) or similar. The lower the figure the better the sensitivity.

Sensitivity is sometimes given with a reference, either ***S/N*** or ***SINAD***.

S/N is the ratio of signal to the background noise. Sinad is the ratio of signal, noise and distortion.

Selectivity is the receivers ability to discriminate between closely located signals.

AUDIO OUTPUT is the power output of the speaker and this is usually given in watts or part of a watt.

As you become more familiar with your scanner, another term that may be encountered is ***IMAGE.***

An image is the receiver duplicating a false transmission on a frequency some distance from the genuine one.

To determine whether or not a received signal is an image or not, it is necessary to determine the ***IF*** or Intermediate Frequency of your receiver (the IF is sometimes given in the "Specifications" section of the handbook).

By doubling the IF then either adding or subtracting it from the suspect frequency you can easily check to see if it is an image or not. While searching out new frequencies the scanner may stop on a frequency where no signal is present, just a humming noise.

This noise is being generated from within the circuitry of the scanner and is known as a ***BIRDIE.***

To ascertain if a frequency is a birdie, simply remove the aerial. If the signal is still there, chances are it is a birdie. Little can be done to eliminate these annoying channels other than to "lock them out".

Strong signals can overload a scanner.

The result is a transmission that sounds like several people talking at once.

Some scanners have ***ATTENUATORS*** built into them and this function reduces the strength of the signal being fed to the receiver thereby cutting the overload.

It doesn't matter if you have a scanner worth $100 or $10,000, the principals are the same. Some have more memory, others have better built-in antennas or more powerful speakers, however, they all operate pretty much in the same way. These devices are to be used in a responsible manner. Don't chase ambulances or hang around accident/fire scenes with your scanner blasting out the channel being used by the emergency services personnel.

All handheld and most mobile scanners have some method by which an ***EARPHONE*** can be connected, so you and you alone can overhear what is going on...use it!

A scanner can be an excellent travelling companion, alerting you to possible road dangers or delays up ahead. A scanner can enhance your enjoyment of many things. Listening to aircraft involved in an airshow is one while another is listening to pit crew and crew to driver instructions at a motor race meeting.Contrary to the beliefs of some people, scanning is not, and has never been, illegal. What **is** illegal is using something that you may hear on the scanner for financial gain. Even the recently introduced Radiocommunications Act 1992 does in way affect the legality of scanning.

Whatever your reason for having a scanner, CB Action welcomes you to an engrossing hobby. This magazine regularly publishes reviews on new model scanners along with details on "secret" frequencies and other articles/reports on scanning in general.

We hope you enjoy Scanning and CB Action

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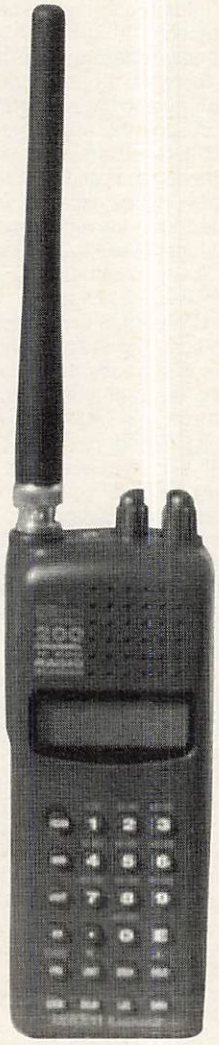

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Uniden's New UBC-144XLT

A new entry-level, wide-band scanning receiver

By Ken Reynolds

A new entry to the wide-band scanning receiver showcase is Uniden's Bearcat UBC-144XLT, which offers a moderate range of features for minimum cost.

Whether aimed at the beginner in scanning, or purpose-built as a rudimentary monitoring receiver for specific tasks, operating this desktop unit is simple and the results effective for most undemanding applications.

The UBC-144XLT is a lightweight desk-top module standing only a couple of inches high (60mm) by 245mm wide and 200mm deep, and weighing 585 grams. The case is moulded from charcoal grey plastic with a 160mm wide, shaped recess to accommodate the data entry keypad and angled display window. Two similarly colored, raised knobs on the right hand side of the fascia, both clearly labelled in white, account for the Squelch and combination Volume and On/Off controls.

As with many scanners, the squelch control operates in reverse to CBs and other radio communications devices.

Maximum squelch level is found in the *anti*-clockwise direction so, to open the squelch gate, the knob must be turned to the right.

This can be fixed easily by reversing the wires on the back of the control potentiometer if you have some skill with a soldering iron — but it's not a job for beginners!

At 450MHz we note that a signal level of 0.2 µV (microvolts) will open the squelch gate when set to threshold, and at its maximum or 'tightest' setting requires only 0.9 µV to produce audio in the loudspeaker. The radio has plenty of audio at minimum distortion and sounds okay using the internal loudspeaker. However, as usual, an external speaker can produce much nicer quality sound.

The easy-to-use data entry keypad is probably one of the most attractive features of the unit.

Unlike most of its competitors, the 'soft touch' keys are arranged to be operated by normal-sized human fingers with none of the cramped uncertainty associated with many portables and even some desk-top scanners.

Each key entry has an associated, unobtrusive 'beep' tone to advise the data has been accepted.

The level of the sound varies with the position of the volume control but it never becomes loud and annoying — unless one finds it irritating that the 'beep' is not user-programmable and can't be turned off.

Other mechanical features of the UBC-144XLT are the antenna connector, external speaker jack and operating power inlet socket.

A small, chrome-plated, telescopic antenna is supplied in the package.

The connector is one of those strange old coaxial plugs usually seen attached to 'car radio' antenna leads, and it looks more like a surgical instrument than anything else. I dunno if anyone really knows what they are called for sure, but I've heard a dozen or so different names over the years.

I suppose they must be cheap, or have some other attraction for the manufacturer, 'cause they can be little buggers at times and certainly don't conform

to any proper communications standard I know! The power supply is also worthy of mention. With at least a squillion 'wall-plug-pack' power supplies and similar-looking battery chargers on the market, already confusing the hell out of the general public, Uniden proudly adds yet another to the fray. The UBC-144XLT comes complete with a 10 volt, AC (alternating current) power supply having a 300mA capacity, and a warning moulded into the back of the plastic scanner case stating AC 10V USE AC-144U ONLY.

In other words, you are discouraged from using one of the Universal style, multi-connector plug packs as a substitute if the original gets misplaced or damaged. You can guess how many dealers in the galaxy will carry one of these little beauties.

Because of this power supply constraint, the UBC-144XLT is strictly a desktop operating unit and cannot be used mobile without a *very* long extension power lead. We were a bit more adventurous than the user manual suggested, though, and plugged in a normal 13 Volt DC regulated power source which operated the receiver quite well.

We did note, however, that the rig would not operate on UHF if the supply voltage was even slightly below 12 volts. Readers are advised NOT to attempt this operation at home...

Two digit display

Although the apparent display window size is about 150mm wide by 20mm high, only a space occupying 15mm by 12mm is actually used for the two digit, red LED display.

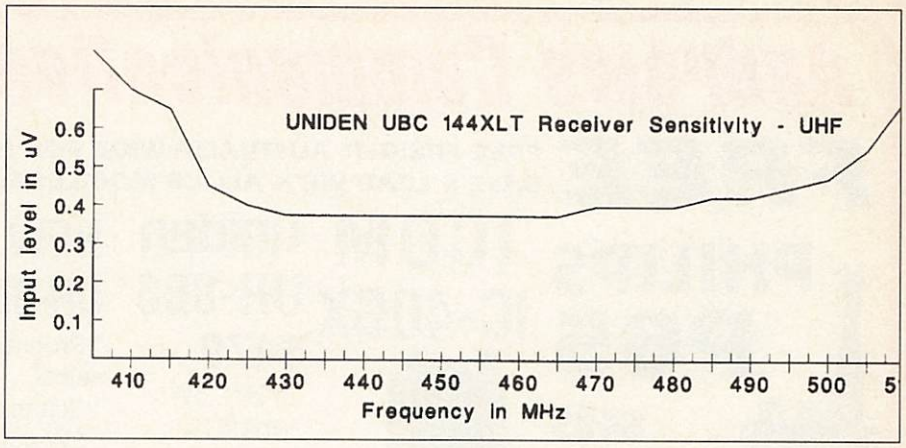
While this might be a bit of an anticlimax, it's amazing what you can do with two digits when you really put your mind to it!

Obviously, economics played a major part in selecting this minimum display and, unlike most scanners which present the operating frequency of the current channel (and frequently much more information), the UBC-144XLT only indicates the current channel number of its possible 16 memory channels.

The bank of 16 memory channels is hopelessly inadequate for most users, but I guess it is better than having only 15 memory channels!

By pressing the MANUAL key — one press for each step — the channel numbers can be incremented one at a time in sequence from 1 to 16 and through to the start again.

To move quickly between unrelated channels simply enter the desired channel number and press MANUAL. The display instantly moves to the new channel.

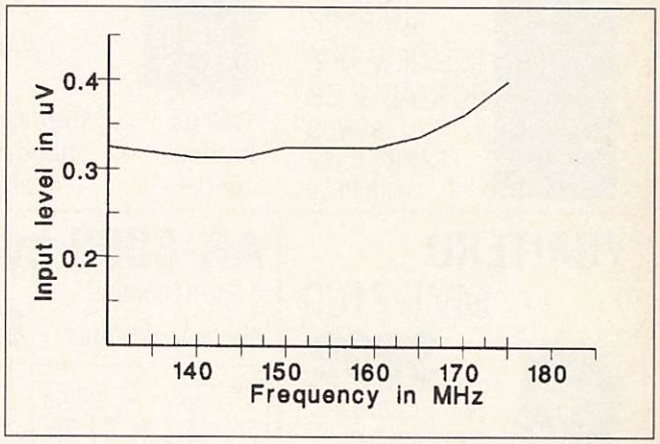


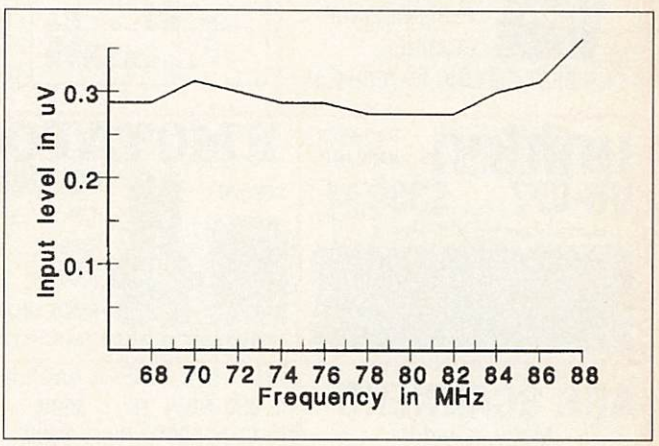
When entering a frequency into a numbered memory register, the LED display indicates the digit as it is entered via the keypad, with each new digit replacing the subsequent entry.

A decimal point is displayed as a central horizontal bar — the central bar of a seven-segment display numeral. When the entry is complete press the 'E' for enter key.

If a valid frequency has been keyed in the display reverts to indicating the current channel number. If an incorrect entry is made an 'E' is displayed to indicate a non-valid entry.

Since no proper frequency is ever displayed in the window it is reasonable to ask "so how do I tell what frequencies are programmed into each channel?".





The UBC-144XLT is provided with a REVIEW key which interrogates the currently-displayed memory register and 'flashes' its contents, digit-by-digit, in the order it was originally entered. This feature can be implemented at any time during use. Uniden suggests in its operating guide that users also keep a note of the memory contents for ready reference.

Two other dot-style LEDs located adjacent to the main digits indicate if the LOCKOUT or WEATHER scan modes are in operation.

The **LOCKOUT** feature is very handy, and operates similarly to the function in some more advanced scanner models. When activated by pressing the LOCKOUT button, the displayed channel will be 'locked-out' from the SCAN sequence, so each time the sequence is repeated any activity on the indicated

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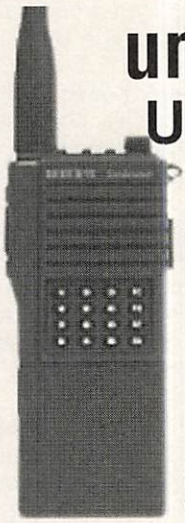

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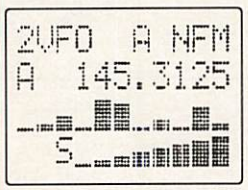

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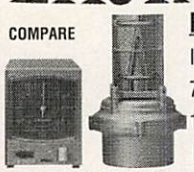

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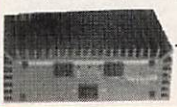

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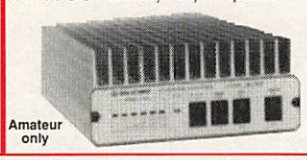

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gi 105CB

Uniden's New UBC-144XLT

(Continued from previous page...)

channel will be ignored by the receiver. The facility is cancelled by pressing the LOCKOUT key for a second time.

The **WEATHER** (weather) scan feature searches for activity on seven pre-programmed VHF channels, however, this is a non-event in Oz as the service does not exist here.

Although the UBC-144XLT has a **PRIORITY** channel scan feature, the priority channel is *always* channel 1, so users should always program their most important frequency in this register.

Scanning speed suggested in the manual is, "up to 15 channels per second".

Our tests indicated the average scan speed was closer to 12 channels per second.

Performance

The UBC-144XLT receiver sensitivity for the 12dB SINAD standard is shown in the graphs, and for a rudimentary scanner its performance is quite good.

This receiver is not for the aviation enthusiasts in our audience. The UBC-144XLT is strictly a Narrow Band FM receiver and the AM demodulation facility is not provided... for that matter, neither is the VHF, AM-only 'air-band' frequency coverage of between 108MHz and 136MHz.

Frequency coverage is shown in **Table 1** below:

Table 1
Frequency in Megahertz (MHz)
66.000 to 88.000 in 5kHz steps
137.000 to 174.000 in 5kHz steps
406.000 to 512.000 in 12.5kHz steps

As with the new UBC-220XLT we reviewed recently, the new prescribed 12.5kHz channel band plan is included for UHF frequencies and ignored for the VHF bands

Summary

The new Bearcat UBC-144XLT enters at the economy end of the market range, offering limited performance and features for those on a limited budget. Basically, you get one whistle and no bells for not much money. What you do get is a stable, attractive wide-band scanning receiver which performs well but has its frequency coverage somewhat restricted at high-band VHF and above 512MHz in the UHF band.

While it is easy to pick faults by revealing the shortcomings of this handy little instrument, it is unfair to make comparisons with rigs costing twice the price and more, especially when the cost of this unit is commensurate with its capabilities and features.

So our verdict is that this one is good value for beginners and for those who only need to monitor a handful of channels. It would make a handy 'second' scanner. I use an Icom IC-R7000 for the serious 'stuff', but I found the UBC-144XLT great for keeping an ear on the local 'coppers' and a few other selected channels.

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CB Action

Online 1995

By Patrick McDonald

The Radio Shack BBS

Now, the other day I had a sudden brainstorm that it might be a good idea to focus a little on those folks so often mentioned here in ONLINE, the sysops who actually run the computer bulletin boards catering for radio hobbyists.

Methought I could informally interview the sysops of said BBSs, give a bit of technical detail on their respective computer systems, find out what their radio interests area, and generally bring a little human interest into this particular cranny (or is it a nook?) of the radio field. What do *you* think?

In any case, I've already made a start on this project with Melbourne's 'The Radio Shack BBS' (FIDONET 3:635/725) aka 'VK3KSK Packet BBS' aka 'F6FBB Packet BBS', located by telephone at (03) 532-5737.

This is an quite an unusual computer bulletin board in so far as it is actually running not just one but *three* different BBSs!

Only a handful of BBSs around Australia operate a similarly combined amateur radio/telephone BBS combination.

The system utilises a special 'packet switch' that handles communications from the three radio ports, and also creates a virtual port for internal communications. The three packet radio ports, accessible only by amateur radio operators, are currently:

two metres (VHF) 144.825 MHz (1200 baud speed)

70 cm (UHF) 439.050 MHz (1200 baud speed)

70 cm (UHF) 434.050 MHz (9600 baud speed — BBS forwarding)

The two packet BBSs which connect to the switch include one which handles the standard packet traffic and mail, and a TCP/IP system running a version of JNOS. This TCP/IP BBS provides standard INTERNET FTP, TELNET, SMTP, etc, over packet radio and is utilised by those amateurs using the 'wormholes' to other sites in the world. These two BBSs are able to talk via the internal port on the packet switch without anything being put to air.

Apart from this packet radio operation, one computer serial port runs a BNU fossil to a Frontdoor frontend and Maximus BBS software and connects thusly to an ordinary telephone line.

The three-part RADIO SHACK system is multi-tasking and runs under QEMM/DESQVIEW. Note, however, that the telephone BBS and the two packet radio BBSs don't directly communicate (they're forbidden that under current SMA regulations, but they're set to change... one day!); the local Australian and Victorian packet messages are exported to a KSK echomail conference.

This echo is bi-directional and amateur radio operators can send packet messages from FIDONET to the packet network if they are set up on the system. Unfortunately, non-amateur messages cannot be sent via this route. The telephone BBS is, however, open to all and sundry.

Sysop **Simon Kay**, **VK3KSK** is an active member of the Victorian Moorabbin and District Radio Club and is always keen to popularise packet radio, regularly giving talks about computers and their operation.

Simon's offsider in the BBS operation is the well-known Dave 'Big Bev' Onley, formerly sysop of the Melbourne-based OZ DX BBS. Let me hasten to point out that David is of average size and not at all feminine.

His nickname comes from his intense involvement in medium wave DXing, and his expertise in constructing very long 'Beverage' antennas, some stretching for more than a kilometre, in order to log east coast North American stations and the like.

BB also has a background in broadcasting, having been involved with 6KA Karratha in Western Australia, where he had own late-night show. He also helped build the new 3CR studios in Melbourne, and has prepared Radio Australia features for the 'Spectrum', 'Talkback' and 'Communicator' programs.

For years a contributor and editor for many DX magazines in Europe, North America and New Zealand, he now writes the MW column for the OZ DX newsletter and is active within FIDONET and INTERNET radio circles.

Last year he combined his OZ DX BBS operation with Simon's bulletin board work, and the two now cooperate to provide a wide range of radio expertise, Simon handling the amateur radio and packet radio side of things, with BB looking after medium wave and tropical band DXing and general shortwave listening.

Simon and Dave point out that the executable files carried on The Radio Shack are for IBM systems; neither has any involvement with MAC or AMIGA computers.

As the name of the BBS implies, it carries 20 separate amateur radio related FIDONET echomail areas, and six further echoes covering shortwave radio listening, satellite communications and scanner monitoring. File areas are similarly comprehensive, with executable programs and frequency listings of all kinds available to callers.

The Radio Shack is currently undergoing a minor reorganisation, as the boys try to make sure that everything is arranged in as user friendly a manner as possible.

They seem to have everything any radio nut could want. Why not drop by with your trusty modem and have a look?

Well, having gone into detail about THE RADIO SHACK BBS, I think I'll complete the national BBS picture before the page runs out, by mentioning a few other radio-related computer bulletin boards around OZ. If reader reaction is favorable, I might check out another one and its sysop in more detail for the next CBA issue.

Radio-related computer bulletin boards

SPECTRUM RADIO BBS is online 24 hours daily on both (03) 459 5837 and (03) 455 1309 and sysop Michael Evans also caters for amateur radio and packet enthusiasts.

The **JK AMATEUR RADIO CLUB BBS** is reachable on (03) 888 7741 in Melbourne under the care of sysop Andrew McColm.

Chris Keladis' **THE TWILIGHT ZONE** in Sydney carries a lot of radio software on (02) 750 6117.

Don't forget Paul Britton's **SATCOM AUSTRALIA BBS** on (02) 905 0849, for all your satellite DXing software requirements and the latest satellite elements for tracking programs. Paul also carries a goodly selection of general radio-related software.

BLUE SATELLITE BBS (sysop Mat Powell) is on (043) 40 4851.

And, finally, venerable Sydney-based **SHORTWAVE POSSUMS BBS** is naturally still alive and kicking on (02) 651 3055, and accepting all modem speeds up to 14,400 bps.

SWP BBS
FREE DISK OFFER

Interested in all this interesting software but got no modem?

Damn! Well, I will personally with my very own little hands post you a nice selection of the kind of radio-related shareware (not commercial) packages reviewed here in this column if you send $35 plus six formatted floppy disks to the usual address for ONLINE:

SHORTWAVE POSSUMS BBS
Attn Patrick McDonald,
PO Box 357,
Round Corner,
NSW 2158

For the sake of high efficiency, I'd suggest posting either 1.2 or 1.44 megabyte floppies.

Naturally, the old-fashioned 360k ones will be okay, if that's all you have, but I won't be able to fit as many compressed files on them!

Please don't just ask for one or two special programs, as this approach kind of defeats the purpose of the exercise, which is to provide a one-off broad sampling of the current best of radio-related shareware.

Regular ONLINE readers know that I'd really prefer that you get you very own modem and download the shareware software yourself via SHORTWAVE POSSUMS BBS, but I can cope with a moderate number of 'manual' inquiries for the time being.

However, please take my advice and investigate the new high speed 14,400 bps modems now available for quite reasonable prices, often as low $299.

Old-fashioned 2400 bps modems are still around, and are still useful, and can often be picked up for under $100 brand new, and for even less used, so you've got no excuse for not buying that modem this year!

Okay, ONLINE's time and space have finally come to an end for this issue, folks.

Give me some feedback via SWP BBS or e-mail through the INTERNET to **patrick@jolt.mpx.com.au**, cuz I'd love to hear from you.

Bye for now!

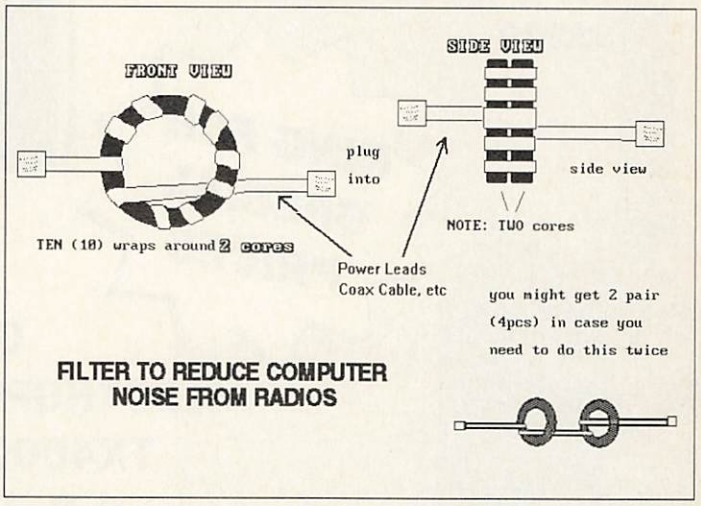
COMPUTER INTERFERENCE NOISE

Computers are invading just about every aspect of life, and nowhere is that more evident than in the field of radio. Computers enable the almost magical functions that we take for granted in the latest models of scanners and communications receivers. We can use computers for logging reception of signals, decoding digital signals to actually controlling those receivers' very functions.

Unfortunately, many computers don't mix well with radio — that is, many computers tend to emit an awful amount of RF interference. If you haven't experienced it, just place your scanner near your operating computer and try scanning the low VHF bands. The same thing generally goes for HF reception, particularly if you use internal antennas.While there is little you can do about noise generated by the computer chips actually built into your radios, there *is* a bit you can do to reduce the noise generated by your computer getting into your radios. One of the first is to try placing your computer equipment as far as possible from the affected radio equipment. This naturally has its limits; it is no good moving the computer out of the room if you actually use the computer with the radio.

Try to make sure that the computer is powered from a different electrical circuit, or at least a different power point to the radio equipment.

Something that makes a big difference in the computer noise experienced is to ensure that all your radio have *external* antenna systems together with low-loss coax cable. I find I experience virtually no HF interference and only noise in the very low VHF area with external antenna systems. Actually I thought my computer system was pretty clean until I used a hand-held scanner with the standard antenna in my radio room... and yuk! Still, it is good compared to some brutes I have experienced.



FILTER TO REDUCE COMPUTER NOISE FROM RADIOS

If you are still experiencing problems after all the above, try winding the power cables of your radios around ferrite cores, as shown in the diagram somewhere around this page. If you can't get 10 winds around the cores, try for as many as you can. It is worth trying this on the smaller computer cables as well. If you have a serial cable leading from your computer to your radios for control or for reception of digital modes, then this could be feeding RF interference right to your equipment too. Earthing this cable at both ends of the run may be of assistance.

Remember, you may not be able to totally rid yourself of this modern torment of radio listening, but it should be possible to reduce it to a tolerable level.

Article by Greg Towells.

(Editor's comment: we had quite a bit of trouble with one computer CBA bought a few years ago. A bit of digging revealed the interesting news that computers approved for sale in the USA had to comply with laws relating to the amount of RF they' leaked', whereas there's no such law in this country. A good hint is to stick with 'name' brands like IBM, Apple, Compaq and the like, because these usually comply with the US rules. Alternatively, try shielding the computer itself — make sure yours has a metal case on all six sides, and that each side is bonded to the earth.)

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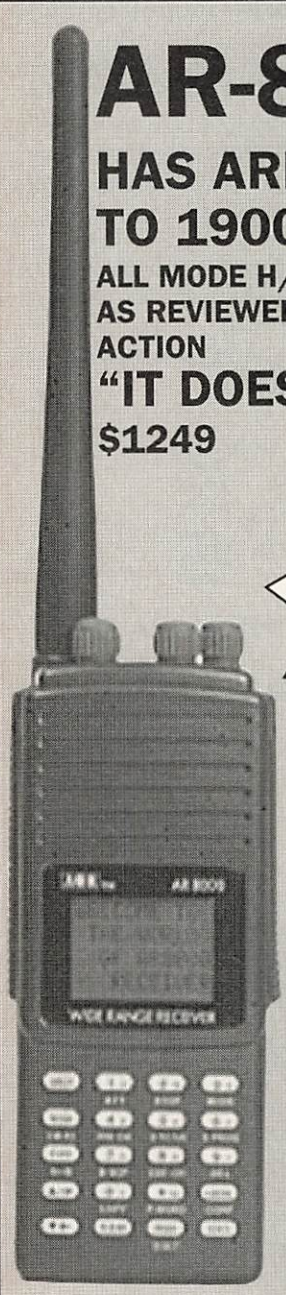

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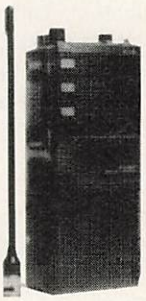

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REDUCING ENGINE NOISE FOR MOBILE CB USE

By Greg Towells

If you are having problems with engine noise in a mobile installation, there are a number of measures you can take yourself to reduce or eliminate the trouble.

Ensure your antenna system is properly tuned and grounded. An SWR reading of 1.5 to 1 will generally indicate that your antenna system is working correctly. Check the amount of noise with and without the antenna cable connected to the radio. If the noise is greater when the antenna is connected, then the source of your problem is probably the ignition system. If you find the noise remains unchanged after disconnecting the antenna, the source is probably in the radio's power supply.

If ignition noise appears to the problem, check (and connect to ground on the chassis/frame if necessary) the engine block, bonnet, muffler and exhaust pipe. These and other parts of the vehicle can act like RF noise transmitters if they are not properly grounded. Ignition noise can be further reduced by installing 'noise suppression' spark plug cables. These are significantly more expensive than the normal types, but are worth the extra money.

For power supply noise, check if you have noise-suppressing capacitors attached to your ignition coil, alternator, and distributor. Install them as necessary, as they can act as filters right at the source of the noise.

Ensure that your antenna feedline and power lines are as far as possible from any of the noise sources mentioned before, especially the engine block. Fit a shielded power cable direct to the battery from your radio. Make sure the shielded cable is of sufficient gauge to handle your radio's power consumption. Also ensure that the shielding of that cable makes proper connection to the vehicle's chassis or frame.

Bear in mind that many cheaper radios are just plain susceptible to noise and the only alternative is to invest in a good quality radio with better noise reduction circuitry. You get what you pay for in most cases. Best of luck.

Sony ICF-2001D fix

One of the most common component failure in the Sony ICF-2001D receiver is generally the exit of the transistor Q303, the AM front end transistor. This failure manifests itself as a decent loss of sensitivity. This could be either sudden or a gradual loss.

The point here is that the fix is a very easy one, and does not involve any adjustments or alignment. If a loss of sensitivity is bugging your ICF-2001D, then here is the possible procedure to fix it:

- Remove the back cover by removing the seven screws that are marked with arrows. One of those screws is hiding in the battery compartment. Leave the computer back up batteries in place.
- Locate transistor **Q303**, which is well marked on the small circuit board near the antenna jack. The terminals are **G**ate, **S**ource, and **D**rain, in that order. The **G** terminal is marked on the board.
- To confirm a problem with transistor Q303, operate the radio in AM mode and measure the voltage from the drain of Q303, to the sleeve of the antenna jack (which is circuit ground). If the measured voltage is substantially below 2.9 volts, it indicates that transistor Q303 is leaky and needs to be replaced.
- Replace Q303 with the readily available **MPF102** or any other low-noise N-channel JFET transistor, and make sure that the D, S and G leads of the transistor are connected correctly. That's all, reassemble the radio and enjoy the improvement.

Hand-held antenna jack hint

The BNC antenna connector is not the most robust connector for the job, and this applies to most hand-helds around nowadays, both transceivers and scanners. The connector nut and the back case form a smooth-to-smooth metal surface, and the connector will eventually come loose.

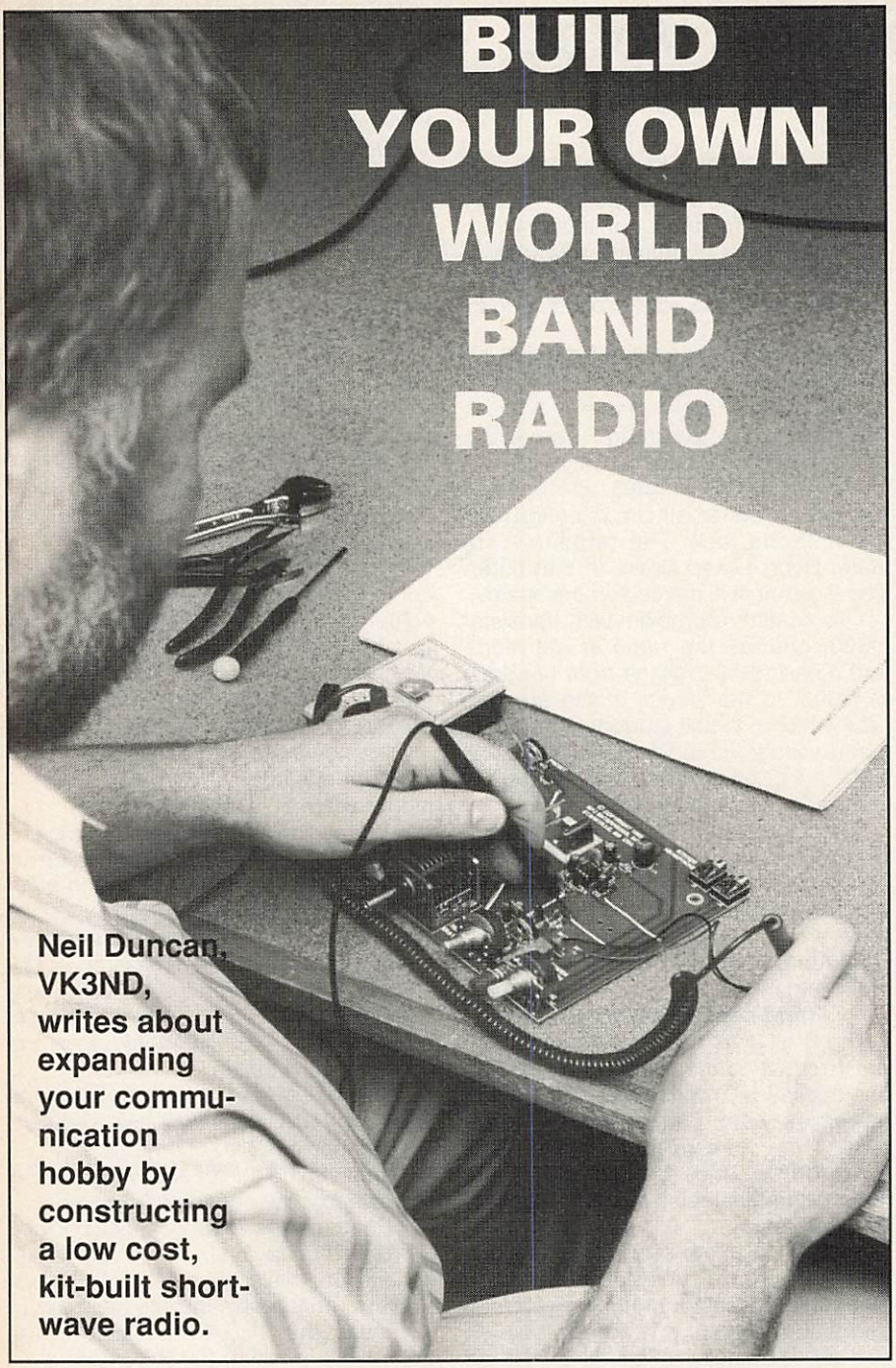
If this befalls your radio, do *not* merely retighten the nut. Instead, take it off, place a lock washer underneath the nut, and then retighten. If you don't, you will end up continually retightening that nut throughout the life of the radio. This is not the best since the wire connecting the BNC to the PC board underneath is solid, and generally the solder connection leaves much to be desired.

If you have already managed to twist the wire loose from the PC board, don't worry, the wire may be reattached. But beware, the procedure is not as simple as just ripping it apart and resoldering. If you have any doubts about your ability to pull apart and reassemble delicate electronic equipment, then find someone responsible who can.

The following procedure is written for the repair of an **Icom IC-R1** scanner, however the same general operation can be applied to most hand-held radios with troublesome BNC antenna jacks. Here we go:

- Remove the two long screws on the upper right of the back case, the small screw in the upper right of the front case (near the tether hole), and the two screws in the bottom of the front case. Put the screws somewhere you will not lose them.
- Separate the front case from the rest of the radio. There is a printed circuit ribbon connecting the front case to the PC board, and the ribbon is located on the right (viewed from the front) side.
- Remove the four Phillips screws which hold the PC board to the back. The Icom IC-R1 is a bit tricky to pull apart, and this may explain some of it: the grey plastic plate on which the three controls on top of the radio (squelch, volume, and tune) are mounted, slides free from the back case. The grey plastic plate, the controls, the power and speaker jacks and the PC board all remove as one piece. Great.
- Remove the 300 mAH battery by pulling it toward you, and note that it is held in place by a metal clip.
- Pull on the lower part of the PC board (nearest the battery), while pushing the power and speaker jacks through the holes, and lift up on the grey plastic top piece, and the whole lot should come free. Note the small piece of rubber which fits between the PC board and the back case and also the position of the small bit of rubber which forms the light/lock push button.
- The simple part is actually fixing the wire to the BNC connector! Here we go:
- Remove the BNC connector.
- Remove the solder and wire from the PC board (in the corner of the board).
- Reattach the BNC connector to the PC board. Yep, after that huge disassemble job, that's it.
- Now, on to reassembling the radio.
- Insert the BNC connector into the hole, while pushing the PC board back into position, taking care to re-insert the grey push button piece on the right side of the case (viewed from the front). Of course, I hope you remembered that lock washer we talked about...
- Refit the grey top piece.
- Place the small rubber shock mount behind the PC board, and reinstall the four screws. A pair of small needle nose pliers will make it easier here.
- Replace the battery, replace the front cover and screws. If everything has been done correctly, your IC-R1 should now burst to life, assuming there is indeed something on the channels you are monitoring.

BUILD YOUR OWN WORLD BAND RADIO



Neil Duncan, VK3ND, writes about expanding your communication hobby by constructing a low cost, kit-built short-wave radio.

There are so many different sides to a hobby in the communications field.
Let me rattle off a few areas that the CB operator might indulge in
— building antennas, working DX, coming to grips with special receivers, running high power (not really, I'm only kidding) and so on.
Here though, we will be thinking in a totally different direction.
What about a return to basics and maybe even to a deeper understanding of the underlying technology of our hobby?

Here on review is a device which is little unusual in several respects. First, it is a black box which arrives as a kit. Yes, that's right you have to build it with a soldering iron, side-cutters, screwdriver and so on. Second, the resulting product is a shortwave receiver which covers a multitude of frequencies, thus presenting you with some new dimensions to your communications hobby. Third, this being the most simple of designs, it offers quite some challenge at the operational level once it is built.

If you are a beginner to the field of communications, a budding short-wave listener with a limited budget or, in particular, if you are a younger person with an enthusiasm to tinker in the wide world of electronics, tune into this — here is a kit of parts accompanied by a highly-detailed 'how to' instruction manual which combine to produce a basic but novel shortwave radio receiver.

In addition, the resulting set gives an excellent introduction to what the people at MFJ call 'world band radio'.

Now, there are not too many kits on the market today directly matching our hobby, let alone for highly sophisticated designs.

In fact, the MFJ-8100 kit design takes on just about most simple design a communication receiver could have. Most assuredly, this project is at the lower end of the difficulty scale — the 'regenerative receiver' design assures you of that. Nevertheless, the final product gives a surprisingly good account of itself.

What is more important, it is a practical proposition to build and you come out with a enormous sense of achievement — I know, I just finished building up an MFJ-8100!

Kit suppliers

So what can you buy by way of a kit these days? Supply houses such as Dick Smith, Rod Irving, Jaycar and Altronics all offer kits of all manner of kit projects.

Not all that many of them are designed for beginners and not very many at all fall within the realm of 'communications'.

In addition, it is fair to say that the instructions accompanying some of these kits, while being clear and precise, assume a sound level of expertise in construction.

The MFJ-8100 kit comes complete with outstanding 'how to' instructions for the less-experienced constructor. For whatever reason, this American company must have decided that there is a

market for a kit like this and went to enormous lengths to help the beginner. I guess the typical scenario they had in mind was for maybe a grandad/mum to buy one of these kits for the budding communicator and electronics whiz grandson/daughter as a birthday or Christmas pressie.

Most assuredly though, a wide range of other people will buy it too, not the least of which will be the CB operator who, having pursued his hobby for years, has a real yearning to explore the basics of what is going on, to extend his or her knowledge of radio and maybe even to look for ways of expanding into amateur radio.

What is an MFJ-8100?

The MFJ-8100 is a regenerative receiver covering 3.5 to 4.3 MHz, 5.90 to 7.40 MHz, 9.5 to 12 MHz, 13.2 to 16.4 MHz and 17.5 to 22 MHz. That is, the MFJ-8100 offers the 3.5, 7, 10, 18 and 21 MHz amateur bands as well as all of the main international short-wave broadcasting frequencies and it does this at a rock bottom price.

Regeneration in a receiver is hardly a new idea. Some of the earliest receivers (I mean, like the ones in the 1920s and 1930s) used regeneration to enhance sensitivity and to keep receiver design simple and inexpensive.

So what is regeneration? Consider the typical feedback howl when someone aims the microphone at the loudspeaker in public address system. Now back off the gain until the system is just on the verge of feedback. Such is the main operational feat when using a regenerative set.

The MFJ-8100 is a kit-built project which offers a lot of fun, a lot of world listening, and a lot of easy-to-learn experience - all at a cost of around $135.

Of course, the 'feedback' we are talking about is at radio, not audio frequencies.

Regeneration uses feedback at the electronic stage where signals arrive from the antenna.

There is a front panel knob on a regenerative set which you adjust so the radio frequency amplifier stage is just about to 'take off' and thus is not actually 'howling' like our PA speakers.

Someone discovered long ago that this effect gives heaps of extra amplification and selectivity to a simple receiver. In return, though, you get a new control which must be set to a precise point — but a point which must be adjusted as you tune around.

The thought of building and using a regenerative receiver takes me back to the days when I was 12 and was given as a kit receiver kit to build.

From start to finish, building it was a joy. As it took shape, I carefully ticked off each box in the manual and did everything I was told to do.

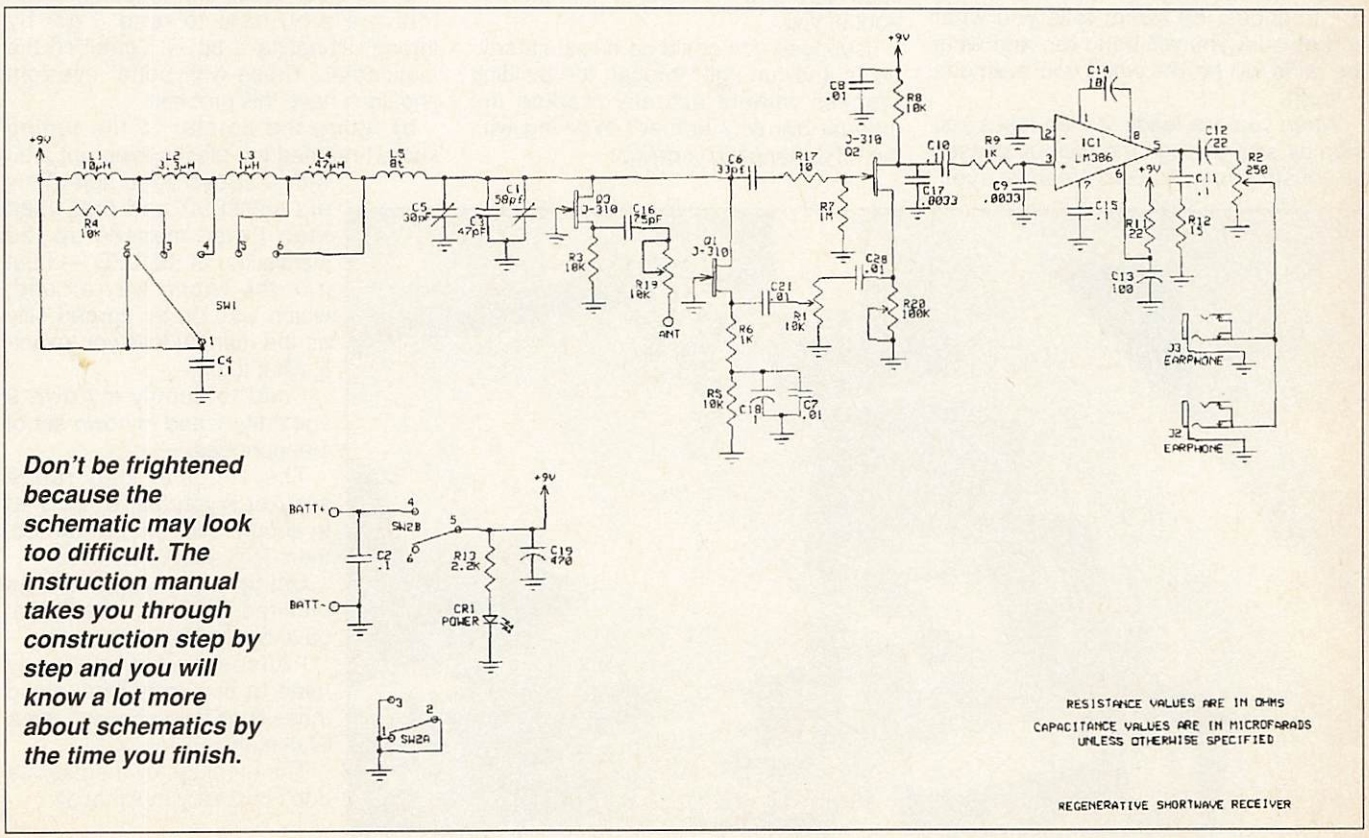
Completing and switching on it was the nearest thing to magic that I had ever seen.

Actually, my dad wasn't too keen on my switching it on at first as when I eventually completed it, he realised that 240 volts (it used valves) lurked beneath the surface.

Eventually, we took it to an amateur radio bloke down the street. He checked it over and gave it a clean bill of health — and *then* we switched it on!

Of course, such high voltage safety considerations are irrelevant for builders of the MFJ-8100. This radio runs off an internal 9 volt battery and is most modest in its power consumption.

....☞



Don't be frightened because the schematic may look too difficult. The instruction manual takes you through construction step by step and you will know a lot more about schematics by the time you finish.

BUILD YOUR OWN WORLD BAND RADIO

(continued from previous page...)

The kit, according to the manual, "is intended to help newcomers, young and old alike, to enjoy discovery through the journey of building up and tuning shortwave radio.

You'll quickly gain the skill of finessing the regeneration control to choose AM shortwave broadcast stations, SSB or CW/RTTY," we are told.

Building it up

Basically, when you open the box you get:

19 fixed capacitors
11 fixed resistors
5 inductors (only one of which you must wind for yourself)
5 semiconductors
6 variable controls
1 aluminium chassis, lid and front panel.
1 bag of nuts an boils and the like
1 printed circuit board with silk screened parts labelling
1 manual

The manual is really *most* impressive. It introduces the radio, tells you what sort of work you will be in for, and what the radio will be like when you eventually finish.

When you are ready, it then takes you step by step through the various phases of construction. As each resistor (yes, an exact identification for each part is provided), nut or bolt is placed in position, you tick off the matching box next to the instruction for it.

There is no guess-work, no need to read circuit diagrams as you go and there is an absolute clarity with respect to picking up which part is needed next, even for the beginner.

MFJ has really thought out the best possible sequence for building the receiver.

There is only one coil to wind — the others are provided as pre-wound inductors which look like little resistors. The labelling on everything (inductors, capacitors and resistors) is right there in front of you.

I suppose you could be a real smarty-pants and run right through the building process without actually reading the manual but why bother? Working with the MFJ manual is a delight.

In my case, it took about five hours to build the MFJ-8100 — and it worked on the very first time.

Mind you, I gave it a pretty thorough checking over before I switched it on. The tools I needed were:

- a soldering iron (a miniature one is best)
- solder (they don't supply any)
- clippers for excess wire (I used a revolting great pair of toe-nail clippers)
- screwdrivers, and
- a pair of pliers.

The only snags I struck were

a) the color codes on the teensy resistors are a bit hard to read. I got by through cheating a bit — I grabbed the multimeter. Those with better eyesight shouldn't have this problem.

b) fitting the pointer to the tuning knob. I reamed the plastic thing out a bit with a scissor (one half of my old scissors) and that fixed that. I also messed up the installation of the LED — I put it in the wrong way around, which was pretty darned silly as the manual tells you exactly what to do.

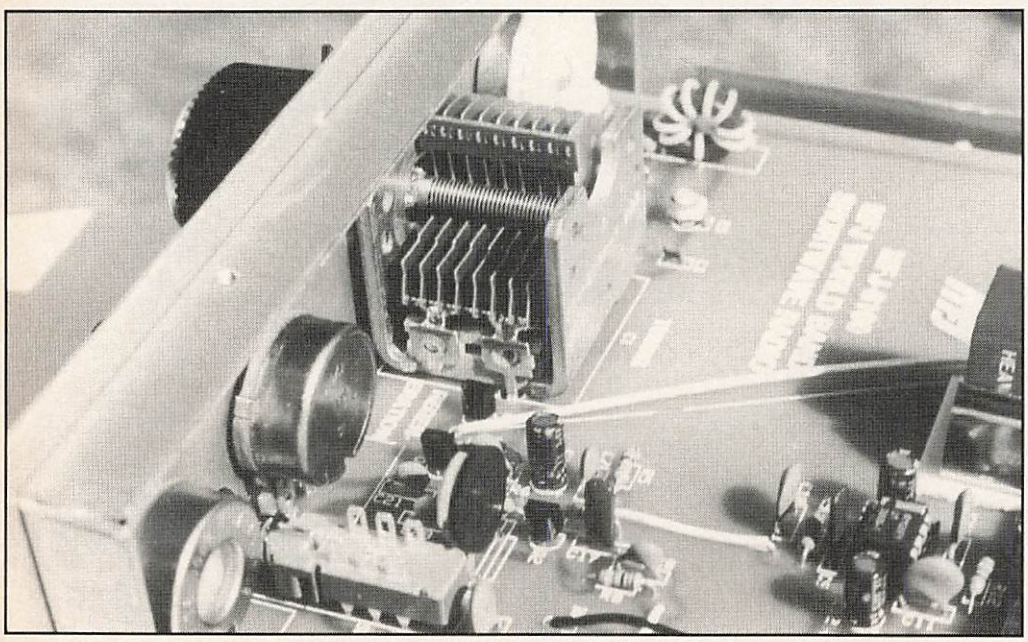
I had to supply my own 9 volt battery and my own set of 'headphones'.

The receiver can run a speaker if you feel so inclined to supply one, but be warned, there isn't a lot of volume.

Using the earplug things pinched from my 'Walkman' gave by far the best results.

I suspect you will really need to buy something along those lines if you haven't got a Walkman.

The earplugs by themselves don't cost very much at all.



Switching it on

Once you have finished, you are also given heaps of information on how to actually use the MFJ-8100, along with general hints on how to put up a simple antenna, how to locate frequencies of interest and general information on how to get the best out of such a simple receiver.

MFJ modestly adds "The MFJ-8100 might just be the very best regenerative receiver ever designed".

The MFJ-8100 kit has three transistors in the front end and some pretty clever enhancements to make the regeneration scheme work better.

It sports exceptional stability for a regenerative set and is smooth to use — stunning stuff relative to my memories of what regeneration can really do to your nerves.

With care, SSB and CW can be 'resolved' by using a small amount of that feedback I mentioned.

At first, the alignment of the dial on the review set was not correct. That is, the frequency being pointed at was not the frequency being listened to. Ideally you need some sort of frequency reference to set it up.

You will either need to find some known signals, to borrow a signal generator or to ask the amateur down the road for a little help.

Tweaking the one trimmer and bunching or un-bunching the turns of the one hand-wound coil are the only actions needed and the whole feat only takes a couple of minutes. It is no real disaster if the dial is wrong but it sure helps if it is right.

Within minutes of switching on, I found myself listening to overseas shortwave stations, tuning SSB signals on 80 metres, having a go at CW on the 20 metre amateur band and generally rediscovering the fun that such simplicity brings.

A regenerative set is easy to build, but the MFJ-8100 is clearly only a beginner's set. SSB won't stay tuned in very long and CW drifts, especially on the higher bands.

Things go a bit strange as the battery starts to die or if the audio output is set too high, I note.

The three knobs on the front panel are used quite a lot when you are doing some serious snooping.

The set has no AGC and thus the audio can be very soft or very loud but you get used to that. In return, you get very clear, undistorted audio — in many situations it is actually better audio than you hear in the 'big sets'.

Summary

I must say I enjoyed the experience of building up the MFJ-8100 receiver kit. I can definitely see people discovering new domains in our hobby with this one. Can I recommend it as a present for a youngster or maybe as a treat for someone who hasn't built much gear but would like to? The simple satisfaction of getting something you have built yourself up an running is a great reward.

There are not a whole lot of things that can go wrong in taking on such a straightforward kit — but I would check that your soldering skills are up to scratch first. Maybe you could practice on some innocent bits and pieces first. Failing that, someone may need to assist you at first or perhaps check over some of the more fiddly bits.

With DX on the higher bands being so dead at the moment (27 MHz being especially included here), just maybe such undertaking as this will really fill a need for many enthusiasts.

Once finished, such a small, light and self contained so will not only be used a lot but will also find itself going on holidays a lot, I reckon!

CB ACTION thanks Daycom Communications for supplying the review kit receiver.

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ONLINE's Patrick McDonald reviews...

THREE CLEVER LOGGING PROGRAMS

It seems that nearly everyone owns a proper computer of one kind or another for word processing, for keeping various kinds of records, or maybe even for controlling a radio transmitter or receiver! As well, pretty well all denizens of the planet have by now heard plenty about the vast computer network called the INTERNET, and many of us radio folks use it daily for communication about our radio hobby.

So let's just plunge right into the radio and computer world in this issue of CBA by looking at three radio logging database programs designed for IBM-compatible computers. Using your PC to keep track of radio-related information is, of course, very sensible, because radio log book entries and suchlike tend to overflow and proliferate, and can be extremely hard to find, or to read, when you really need the info at critical moments.

However, the three logging programs we'll survey are actually quite different in many respects, as you'll soon see!

SWLOGIT v1.12

Very recently-released **SWLIT112.ZIP**, or SWLOGIT version 1.12, is advertised by its Canadian author as 'the *only* program shortwave listeners will *ever* need.' Now, that's quite a slogan to live up to!

SWLOGIT's many options include a QSL script writer which automatically writes out reception reports for you, MUF ionospheric propagation mapping, a sun terminator/greyline DX aid, a world clock, VGA/EGA world maps, instant calculation of sunrise/sunset times... and, of course, a complete radio log/database program.

Software author David Toste writes in his documentation for SWLOGIT: "This program started off as a ham radio operator's database, and then halfway through the program I decided to write a database especially for shortwave listeners. Since I couldn't find a program already out there with all the options I wanted, I had decided to write my own."

One of the many unusual features of the SWLOGIT database is its built-in ability to plot the MUF (Maximum Useable Frequency) for the entire world or for just one small section of the globe, such as the Australasian region; and, as well, SWLOGIT can plot out the so-called Sun Terminator Line, showing which sections of the globe are in daylight and which are in darkness, and where these areas meet on the crucial 'greyline', where the weird and unexpected DX signals can be hunted.

The MUF Mapping feature is another interesting built-in option. When you really want to know what's going on with ionospheric conditions around the world, SWLOGIT's MUF WorldMap feature will plot out the MUF for the entire world. This way you will be able to see from which direction most of the DX should be coming.

Take note: this MUF calculating process may be slow on some older machines. As a default, the resolution has been set to 10 degrees. What this means is that the program will jump every 10 degrees and then calculate the MUF. You may set the resolution to a lower number, but on a 386DX at the speed of 40 MHz with no math co-processor, it will require about two minutes to plot out the world map even with the default settings. My 486DX2 running at 66 MHz took well under a minute. When set at one degree, however, SWLOGIT kept locking up right around the equator; two degrees resolution was the best I could achieve.

Some of you may be using GEOCLOCK and MINIMUF for these two purposes, and both are excellent programs, definitely better than some of SWLOGIT's features. However, it might sometimes be very handy to have these capabilities within a database program.

The reception report writer is also a fairly unique function to have within a log program. The well-known and previously-reviewed SWL120 package is an alternative stand-alone option, and has much better features for this purpose, but once again it may be useful to have a simple report facility right within the database, so that your log details can be instantly placed into a reception report.

Nevertheless, I have to say that I believe SWLOGIT's report-writing facility pretty rudimentary. For instance, there is very little space within the 'comments' section for you to write both program details and give some relevant listener feedback. And automatic translation into Spanish, French or other languages, such as is available in SWL120, is a long way off!

This brings us to the SWLOGIT database itself, which is of course the main point of the program. I think this basic feature is quite okay. Personally, I might have included a few different functions, such as the date when a reception report was sent and the date when a QSL was received, but this is a very individual thing with radio buffs. The usual requirements, such as the ability to add or delete entries, and to do searches on all fields, are included and seem to work adequately.

However, try as I might, I couldn't get the F1 key HELP feature to kick in. Did I do something wrong, or is this a bug in SWLOGIT? I'm still trying to find out. Nevertheless, the program is otherwise pretty easy to set up and use, and includes documentation within the compressed file package, which you can print out and refer to at your leisure.

SWLOGIT will run on a basic XT PC, but will run very, *very*, ***VERY*** slowly indeed on any machine less than a 386SX! It needs DOS v3.3 or higher and 570k minimum of memory. It will work without a mouse, but a mouse will help make things run more easily. Your hard drive will have to find space for a minimum of 1.4 megabytes of data, and the database will most certainly grow as you add new logs. As for video required, any type will do: CGA, EGA, or VGA. Because there are complex graphics involved in some mapping features, you will not be able to use those options fully unless you have EGA or VGA video capability.

SWLIT112.ZIP is available as share-

ware, on a pay-if-you-use-it-regularly honor system basis, but might be a bit hard to find, as it's very new. Check one of the radio-orientated BBSs listed below if you're interested. You can also contact the SWLOGIT author directly via the INTERNET at the address of **aa521@freenet.toronto.on.ca** or via The Listening Post BBS in Canada on 0015 1 905 841 6490 (FIDONET 1:250/930)

HYPERLOG v2.25

The **HYPERLOG** 'Electronic Logbook' by Joe Spear, AH8B/W4 is a well-known shareware amateur radio logging program designed to make the amateur's life easier by organising contacts, WAS (Worked All States), WAZ (Worked All Zones), and DXCC information and displaying it in an easy-to-read format.

It also displays other helpful data on screen during a QSO. HYPERLOG provides previous contact retrieval using a very fast B+ tree indexed search technique and displays these contacts in a scrolling window on the main screen as well as offering a full screen complete database browser. All this makes it easy to find out what you need to know instantly, while attending to your transceiver.

As of version 2.0, HYPERLOG additionally offers Packet Radio support. This includes DX PacketCluster capability, where HYPERLOG will monitor the PacketCluster, watching tirelessly for DX announcements. When it sees one, it does a high-speed database search based on your own pre-set criteria to determine if you desire the country/state that has appeared.

If you do need it, HYPERLOG loads the spot in a scrolling window, and emits a distinctive chime to let you know a spot has arrived! After opening the Spot Window, if you decide to work the spotted station, you can simply hit <enter> and your radio will be set to the relevant frequency automatically. In addition, when you finish working the station, you can simply press a key combination to return to the frequency you were on previously. This really makes DXing a bit easier! Of course, to QSY the radio in this fashion, it must be properly interfaced to your computer.

The following plethora of rigs are compatible with HYPERLOG: all Kenwood models; Yaesu models FT-736R, FT-747GX, FT-757GX Mk II, FT-767GX, FT-890, FT-980, FT-990 and FT-1000; Icom models IC-R71, IC-R7000, IC-R9000, IC-271, IC-275, IC-471, IC-475, IC-575, IC-725, IC-726, IC-728, IC-729, IC-735, IC-736, IC-737, IC-738, IC-751, IC-761, IC-765, IC-781, IC-970, IC-1271 and IC-1275, plus the capable Omni VI from US manufacturer Ten-Tec.

Naturally, the HYPERLOG program can also be used by shortwave radio listeners and scanner enthusiasts (you will have noted a number of Icom receivers in the above list), though many of HYPERLOG's more esoteric amateur functions will not then be of much use.

The program also provides several windows of statistics on the worked/confirmed status of countries (as well as US state totals) by band, by mode and by mixed mode totals, for all 16 bands and eight modes. By having this information immediately available with the press of a key or two, the amateur radio operator can quickly determine if a particular country or state is needed for an award or endorsement.

A built-in 10-minute timer with an on-screen countdown clock is an exclusive for HYPERLOG. You don't have to wonder when you last IDed with this feature enabled. It will always notify you with an alarm when it is time to make an SMA-mandatory station ID.

A couple of other new features for version 2.0 of HYPERLOG include database browsing and report browsing features. The database browser allows you to scroll through your entire database and edit or delete any contact you desire. The report browser allows 'print to screen' capabilities in that it will read a report created on disk by HYPERLOG and allow the user to scroll through as well as find any data in the report.

HYPERLOG is designed to work on an IBM PC or 100 per cent compatible computer with a minimum of 512K of RAM *free* and a hard disk. The program will operate on any standard 80 column monitor/adaptor system (MONO, CGA, EGA, VGA, HERCULES).

Bearing and distance details are provided by decoding the prefix of the call sign to determine the country or state of origin and then looking up the correct latitude and longitude coordinates in a table. These coordinates, as well as your local coordinates, are then fed to a Great Circle calculation routine to obtain bearing and distance information.

A potentially handy feature for hams is the Net/RoundTable mode. This mode allows you to tell the program to start recording call signs, name and QTH data from the contacts you enter and display this info in a scrolling window on screen. This lets you easily keep track of check-ins if you are a net control station, or provides an easy-to-see reference as to who is in a round table discussion. These contacts can be sorted by call sign or QTH for your convenience. When a station checks in with traffic for, say, Perth, simply use the Up or Down arrow keys to quickly look up the call sign of any station previously checked in from Perth. Very handy indeed.

When the Net/RoundTable Mode is activated, a window will appear at the bottom of the screen and a prompt will ask if you want to add the current contact to the window. If you respond 'Y' then it will be added automatically. In any case, the cursor will be placed in the Net/RoundTable window at the first character position of the Call prompt. You can then manually enter as many calls as you like. From this point on, all contacts logged will automatically be included in the Net/RoundTable window until you close the window.

Another HYPERLOG special is the Autopilot mode, designed to alleviate a lot of extra work by automatically entering data that frequently remains the same for several contacts.

What is the point of keying in the date, time, band, mode, power, and frequency as you continue to work stations on the same band using the same mode at the same power level and the same frequency? Why should you have to constantly enter the date and time when you have a perfectly good clock and calendar ticking away in your PC? Why not have these inputs done automatically for you? This is where HYPERLOG shines, as it makes your computer do the things that computers were designed to do... and gives you more time to attend to your QSOs. DXCC information is systematically accumulated as you work stations in different countries/states and is automatically updated when a contact is edited in such a way that the change affects your statistics.

The program's ALT-U command brings up the Utility/Print menu. HYPERLOG has all the reports you'll ever need to keep track of WAS, WAZ, and DXCC information, as well as listing previous contacts sorted by call sign, date, band, call sign plus date, etc. As a bonus, you can also print out the country list centred

....☞

ONLINE's Patrick McDonald reviews...

THREE CLEVER LOGGING PROGRAMS

(continued from page 21...)

on any latitude/longitude coordinates, and have it sorted by prefix or country name!

"This is a great way to recoup part or all of the registration cost of HYPERLOG," says author Spears, suggesting that you can generate and sell bearing/distance listings to all your ham friends who are without PCs! HYPERLOG also contains a complete label printing module that allows you to not only prepare a QSL label for each contact, but also (optionally) print an address label.

There are two packet windows in HYPERLOG. One is a view-only window, overlaying the Previous Contacts window. If your TNC is on and you have entered the correct information in your initial configuration file, you should see the CMD: prompt after the window opens. The second packet window is a full screen window with data entry capability. Simply type any TNC commands or data you want to go to the TNC, press return, and it will be sent.

For VHF PacketCluster operation, you don't have to be connected for HYPERLOG to monitor and watch for DX Spots. Obviously, you will see a lot more traffic if you are not connected, but otherwise there is no difference in HYPERLOG's operation. It will still monitor and notify you when a Spot arrives that you need to check.

In fact, you don't need to have a Packet window open at all. HYPERLOG is designed to watch for DX Spots completely in the background and only interrupt you when a Spot meets the criteria you can select.

As well, you can create text files and HYPERLOG will automatically send them for you. One of these can be a 'Brag' file containing information about your radio setup, or whatever. Whenever you press ALT-B, HYPERLOG will then send this file! HYPERLOG will send a variety of other files automatically too, and will upload any ASCII (text) file.

Finally, HYPERLOG has the facility to tie in with GEOCLOCK or other greyline DX program & allows any such program to be called up with a keystroke.

Not a bad listing of nifty features, huh? And I'll tell you... I had to cut down this review considerably, due to space constraints! HYPERLOG is jam-packed with functions, as one would expect after so many upgrades over the years. Note that the compressed file name for the current program is **HLOG225.ZIP**, if PKZIP compression is used, but the file extension may be .ARJ or .LZH if other compression programs are utilised.

HAMLOG v3.11

Okay, let's turn the page to another ham radio database now. Like HYPERLOG, **HAMLOG version 3.11**, written by Sydney-based Robin Gandevia, VK2VN, is a comprehensive radio logging program, designed primarily for use by amateur radio operators (hams), but also useable by shortwave listeners.

HAMLOG has a wide array of features, yet is fairly simple and fast to install and use. Fully menu-driven, HAMLOG supplies extensive context-sensitive help and information, available by simply pressing the F1 function key (which really works).

It has six separate but combinable logs, a fast Contest Mode, QSL printing facilities, lots of online radio info, and a free-form notes system that can be called up at any time.

All logged information is calculated automatically as each QSO entry is added (eg UTC times and country details). As well, as with HYPERLOG, much data can be pre-set (such as Mode and Frequency) and automatically applied to all new QSOs.

Six separate logs, each with two different modes, may be simultaneously maintained, with the provision to combine logs (including creating a log from an existing log based on frequency, modes and other data). Country QSO and QSL statistics are always available separately for each log. Details of all countries worked and confirmed, in both of a log's modes are also available and all current DXCC prefix and country information is provided and is constantly updated. In the HAMLOG's special 'Contest Mode', QSOs are extremely quick to add (with details of any previous contacts with a station shown), and there is provision for points and multipliers. Apart from a log's complete country details, the statistics kept also show the number of contacts, countries worked, countries confirmed, per mode and per band. Most of this information can be shown on the screen, or sent to a printer or saved to a DOS file. A DOS file allows you to use the information in other programs such as your word processor or a spreadsheet.

Text from other programs (such as PACTOR or other digital modes) can also be imported into HAMLOG, and associated with any specific QSO.

HAMLOG will also keep track of all your QSLs, both inwards and outwards. As for printing QSLs, several standard label formats are provided, as well as a special Custom Label Format, where you specify exactly what you want printed for layouts on 'smart' QSL cards. And here's a nice touch... when you work a

Ham Log's operating manual is a professionally printed book - in keeping with the professionalism of the program.

HAM LOG 3

for

Amateur Radio Operators

OPERATING MANUAL

VERSION 3

Robin Gandevia

country, HAMLOG will not only tell you whether to say 'Good Morning', 'Good Afternoon' or 'Good Evening', but often *how* to say it in your contact's non-English language.

Translations for many common phrases and words are provided for more than 150 countries. A truly large amount of useful information is available virtually at any time throughout the HAMLOG program.

This may include items such as HF band plans, HF beacons, WWV data, temperature and metric conversions, Q codes, CW abbreviations and more. The new Custom Field that has been added to HAMLOG's QSO log database with version 3 can be employed for a variety of uses. Potentially, it's a very powerful tool... with an indexed 10 character field, it can contain various kinds of information, including information from the QSO's country.

Information can be added automatically to the Custom Field (set in the program's QSO & Log Defaults) as each QSO is added, or applied to various groups of QSOs from the Custom Field Utilities Menu. It's ideal as a generic system for users chasing a multitude of awards, and can be searched on, and lists can be based on its contents.

From the Log Scroll Menu and the QSO Menu, you can set the order to that of Custom Field. When in the Log Scroll Menu, the QSO's name information is replaced with the Custom Field information, thus easily grouping QSOs. Logs can then be combined (or created) by specific contents of the Custom Field.

Each QSO includes the following extra information: the date a QSL was sent; the date a QSL was received; any QSLs received direct; and the Custom Field (containing 10 characters & indexed). Much of this QSO information can of course be added automatically by HAMLOG.

The principal countries database maintains records of all six logs at once. The updating process is automatic as required by new or changed entries. More information is available when viewing a country, including the QSO numbers of first worked and confirmed QSOs, in each mode.

There's a lot more that could be said, but HAMLOG is too comprehensive a program to be summarised in such a short article.

A reviewer in 'The Canadian Amateur' ham radio magazine wrote "This is the first computer program I have used in years that I really cannot find anything to improve on.

With so many features, it is beyond this reviewer's ability to do it full justice." High praise indeed! And this was written about HAMLOG version 2.5, more than a year ago...!

HAMLOG is a commercial and *not* a shareware program, and can be sourced directly from the author:
Robin Gandevia, VK2VN
74 Carrington Road,
Waverley NSW 2024
Telephone: (02) 369 2008
Facsimile: (02) 369 3069

Each registered copy of HAMLOG v3 costs $59.00 plus $5 per copy shipping cost (within Australia).

You may now be asking yourself: which one of these three elaborate database programs is the right one for me? Well, it's difficult for little old me to tell you, because every radio hobbyist's needs and interests vary considerably!

If you're an amateur radio operator, you should consider both HYPERLOG and HAMLOG.

These two programs are extremely battle-hardened: both have gone through a number of versions and upgrades, and both are highly regarded by computer-wielding hams around the world.

HYPERLOG is entirely shareware, giving you the opportunity to experiment with the whole package at no charge. However, commercial HAMLOG does come in a useful demo version that permits a pretty good overview of its features before you purchase the full package. Why not download 'em both from your local BBS and put 'em through their paces? It will only cost you a phone call...

I've got the latest HAMLOG demo available online here at SWP BBS as **HAM_LOG3.ZIP**, but remember that the file extension may vary if other file compression programs are used. And beware of other, earlier ham radio logging programs with similar names!

HAMLOG is specifically designed for amateurs and, as such, is arguably the best on the commercial market and is even selling overseas. If your looging needs are minimal, one of the other reviewed log programs will probably suit you better, however, if you're a serious DXer or have intentions of gaining an amateur licence you will not do better.

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Bandspread

By Greg Towells

MOBILE TRANSCEIVER MOUNTING HINTS

This one-pager is in answer to *lots* of questions I have received about installing CB radios (and other transceivers) into vehicles.

Since the interior of most vehicles are vastly different to each other there is little I can say in regard to this. Try to find a location which will not interfere with the driving during mobile operation, yet is easy to access and reach the controls. In many modern cars, it will be nigh-on impossible to satisfy all those conditions, so the most important is to mount the radio in a safe location. Use big, self-tapping sheet metal screws and lock washers to ensure that the radio cannot come loose and turn into a missile during a collision, or just when you drive over a big pothole.

An antenna will always perform to its best mounted in the center of a metal roof. The next best is on a gutter grip, then boot or bonnet mounted. Consider the magnetic mount option to be a very temporary option at best. The best antenna is the longest antenna possible, however you have to compromise yet again. Few vehicles look good with a nine-footer mounted smack in the middle of the roof! Generally, a 1.5 metre antenna is the longest for practicable purposes you would want on the roof.

Since the best performance is obtained by installing the antenna on a good groundplane, such as the roof of a car, then if you want the best from your mobile install that is where you will hope to place it. Unfortunately, a roof mount is probably the most difficult antenna install to carry out. Vehicle manufacturers seem to design their cars specifically to make it difficult for transceivers to be fitted in — and warning... some vehicles have foam pumped into the A, B and C pillars (the bits which hold the roof on!) in order to reduce noise. This foam makes it impossible to feed coax down the pillar so CHECK FIRST BEFORE YOU DRILL!!!

Here are some other hints I have picked up from many installations, all strung together...

First, check out your vehicle. Is there an interior light fixture underneath a good roof spot for the antenna? If so, then *maybe* your vehicle manufacturer has not made it so difficult after all. In this case, there will already be cable channels and additionally you can drill into the roof without having to fiddle with the headlining cloth... but check the A pillars first!

Remove the interior light assembly, drill the hole and fish the coax cable. This should take less than half an hour, even for a first timer. Drill UP from inside, first with a 1/8 inch drill, then with a 3/8 inch. If your antenna mount needs a larger hole, use an antenna drill, or a tapered reamer.

To fish the cable through the car chassis, use a piece of coat hanger wire or similar. It should be stiff enough to shove down channels and doorposts, and strong enough to enable you to use it to pull the coax back up. Take off all the decorative covers, kick plates, etc, and follow the route used to run the wiring at the time of manufacture. Generally, there is enough space left to route at least one piece of RG58 through the channel.

It's a good idea to bend the end of the wire over into a blunt end if you are fishing past cloth which could tear. Wrap a little tape over the bent end so that it doesn't act like a hook and snag on something.

If your car doesn't have an interior light in the desired location, then check the headlining. If it is stretched cloth which is not glued to the underside of the roof, then you are still there with a chance. Peel away the moulding at the edge above the door, and carefully peel the headlining cloth off the glue where it is stuck to the doorframe. Fish the coax from the radio location to the top of the door before you finalise the antenna location, since some vehicles don't leave cable channels you can use. Remember that you can always tuck the cable behind the moulding or inside window gaskets if you have to.

To drill the roof in a car with a stretched headlining, first take a couple of safety pins and hook them into the cloth below where you are going to drill. Hang some fishing sinkers from them to pull the headlining away from the roof. Prepare your drill, stick a piece of aquarium tubing over the 1/8 inch bit and tape it in place so that when the drill breaks through, only about 1 cm can penetrate.

Do the same with the 3/8 inch bit (a piece of garden hose is good for this). Find the center of the roof by snapping a chalk line or running a piece of string from the center of the bonnet (hint: the rear view mirror is usually slap in the center) to the center of the back window.

Put a small bottle or the antenna in the intended place and walk around the car a couple of times until you are convinced that it's right in the middle. It is way too late to realise that the antenna is off-center after you drill the hole!

Centerpunch the hole and drill, first with the 1/8 inch bit then with the 3/8 inch. Again, enlarge the hole with a tapered reamer if you need to. Now, from the top of the roof, push your fish wire down and to the side where you left the coax hanging at the roofline, and pull it back up through the hole and attach it to the mount.

To supply power for your radio, it is best to go straight to the battery, using heavy-duty shielded cable, or just heavy power cable will do. This will eliminate a lot of ignition noise from your radio. It's always a good idea to run the positive lead direct to the positive terminal, but it can be better in some cars to put the earth cable *not* to the earth terminal of the battery, but to the vehicle body near the battery. In case you're wondering, this is so the car's electrical system doesn't use your nice new wire as an earth return for the car's electrics if its own earth return through the body is a bit resistive.

Wiring cables to the ignition switch is generally acceptable for low-current equipment like CB radios or scanners; however, you'll have to be prepared to accept ignition noise on receive if you are unlucky. High-current devices like amplifiers cannot be wired through the ignition switch, as the voltage drop will seriously degrade the amplifier's performance and could even harm the vehicle wiring.

Using the cigarette lighter socket for power is only good for a temporary installation...

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THE INVISIBLE CONNECTION

Part Two

By Ken Reynolds

This article follows on Part One which appeared in the November/December issue of CBA.

When the discussion turns to radiowaves, transmission lines and antennas, readers will note the continual recurrence of one main theme — the half-wavelength. In fact, most antennas operating at the sub-microwave frequency bands are based heavily on this half-wavelength radiator strategy to deliver the goods efficiently.

Even the humble quarter-wave ground plane antenna pans out as a half-wavelength radiator in most cases, whether it be the classic shape base station configuration employing a quarter-wavelength vertical radiating element atop a ground plane of spreading, similar length radials, or a shortened, so-called 27MHz 'helical' whip that adorns your car. (See **figure 1**.)

Although the latter case is more difficult to visualise as a half-wave antenna it is not at all difficult to grasp the concept...

A shortened antenna such as a mobile whip still needs to appear like a full-size antenna to the transmitter to meet the correct load impedance requirements, which is 50 ohms resistance with neither capacitive or inductive reactance.

Impedance, as we already know, is the term used to describe a circuit (antenna in this case) containing **resistance**, **inductive reactance** and **capacitive reactance**. So, our properly tuned and installed CB antenna should have:

Resistance = 50 ohms

Inductive Reactance = zero ohms

Capacitive Reactance = zero ohms

But, remember, this pure resistance condition applies only at the antenna's resonant frequency. At frequencies either side of resonance, the impedance value may vary wildly, having reactance values of hundreds or even *thousands* of ohms.

A properly-designed and installed, full-size half-wave antenna at its resonant frequency appears to the transmitter as purely resistance, with no reactive component — and a mobile whip should exhibit similar properties.

If an antenna is made too long it is said to have inductive reactance, which appears to the transmitter a bit like putting a small coil of wire in series with the active element. If, on the other hand, the antenna is too short at the desired operating frequency, it will appear to have some value of capacitance in series and is said to have capacitive reactance.

Capacitive and inductive reactances are just technical terms to describe that the antenna is not in the desired state of pure resistance or 'resistive equilibrium'. For the antenna to function properly by absorbing and re-radiating all the power supplied to it by the transmitter, it must show only pure resistance to the generator (transmitter).

Now it's easy to understand why your shortened mobile whip antenna has a loading coil somewhere along its length. Because the whip is too short for proper operation at the desired frequency it exhibits capacitive reactance — in other words, it appears from the transmitter's perspective to have a capacitor in series with the radiator, and it therefore cannot absorb and use all the power supplied to it. In this scenario, unused power is returned (reflected) back down the transmission line straight back to the transmitter!

An antenna in this sad state is described as having or being:

- an impedance mismatch.
- is capacitive
- has a 'bad' or high Standing-wave Ratio (SWR)
- is 'out of tune', and
- has a low return loss

Since capacitive reactance is the opposite of inductive reactance — a bit like plus and minus quantities — it stands to reason that a quantity of one can be used to neutralise the effect of the other. Let's put it another way: one can be used to cancel out the effect of the other and return the complex impedance value to a pure resistance. So the coil of wire on your mobile whip is simply used to cancel out the capacitance component and allow the antenna to function properly — *not* to turn the antenna into some exotic five-eighths or other number radiator as the legend would seem to have it.

If the whip was too long we would use opposite component values to **match** the antenna. This approximates one half of a center-fed antenna, while the car body itself, or a connection to the earth via the outer braid connection of the coaxial feedline, roughly approximates the other half of the antenna.

While the electrical compromises made in this scenario almost defy description, we end up with quite a successful mobile antenna installation (most times at least), and the main sacrifice is loss of symmetry in the radiated signal

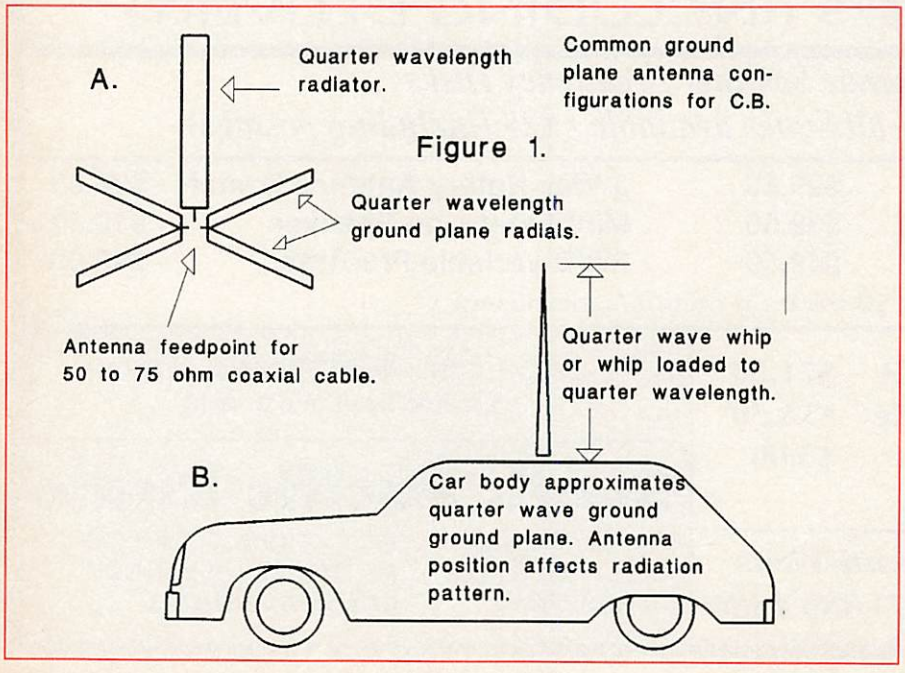

A.
Quarter wavelength radiator.
Common ground plane antenna configurations for C.B.
Quarter wavelength ground plane radials.
Antenna feedpoint for 50 to 75 ohm coaxial cable.
Quarter wave whip or whip loaded to quarter wavelength.
B.
Car body approximates quarter wave ground ground plane. Antenna position affects radiation pattern.

Figure 1.

pattern. But that's another story...

Practical antennas to build

Last issue we briefly examined the inverted 'V' antenna and how to hang one from a mast or convenient tree. Another simple but effective antenna is the quarter-wave **ground plane**, which can be constructed with little expense or trouble from a few metres of wire (or metal tube if you desire a more self-supporting assembly).

Ground plane antennas usually employ a vertical, quarter-wavelength radiator as the main active element. This is generally raised a centimetre or two above a conductive metal ground sheet or a number of metal 'radials' in an arrangement similar to that shown in **figure 3a**.

The ground plane antenna has fallen out of favor for HF band operation in recent years because of its clumsy, space-hungry design and the ease with which one can buy an 'off-the-hook' end-fed half-wave vertical antenna requiring minimal space for effective operation.

However, the truth of the matter is that the trusty quarter-wave is an efficient, economical design not too cumbersome for use on 27MHz CB and at higher frequencies.

The quarter-wave ground plane antenna offers three distinct advantages to the novice (and advanced) home constructor:

1. The array is simple and economical to build.

2. The feed point is unbalanced and is therefore suitable for direct feed with normal coaxial cable.

3. It requires little or no impedance matching for 50 ohm cable.

In its most rudimentary form, this antenna might be a loaded whip antenna attached to a mobile antenna base installed through the steel roof of a garden shed or garage as in **figure 4b**.

Figure 4a indicates how it might appear electrically to your CB rig. The image of the vertical whip appears as a reflection in the conducting metal roof (ground plane) — almost the same as it would appear to the eye if the roof was an optical mirror viewed from an angle above the ground plane. Therefore, if the radiator is electrically a quarter of a-wavelength long, the reflection will appear to be a quarter-wavelength long too.

Combined, the quarter-wave radiator plus its mirror image equals... you guessed it, a one half-wavelength antenna! And, just like any other optical reflection, if the mirror surface is not uniform the reflection will be a product of that distortion.

This explains why you will often hear it suggested that you install your mobile whip in the center of your car's roof — this should give the antenna system the most uniform image and, therefore, the most evenly-distributed radiation pattern... but that, too, is another story...

Last issue we observed how the feed impedance of a **dipole** altered in relation to the angle between the two symmetrical arms. The feed impedance of a ground plane antenna varies in a similar way. When the radiator is perpendicular to the ground plane the impedance at resonance is about 35 ohms.

If your garage had a peaked roof something like a pyramid with the antenna mounted at the peak, the impedance would be modified in relation to the angles between the radiator and the angled ground plane elements.

Remember that a dipole with the arms at 180 degrees (end-to-end) had a feed impedance of about 70 ohms, so we can make an assumption here that when the arms are somewhere between 90 and 180° the feed impedance will be somewhere between 35 and 70 ohms.

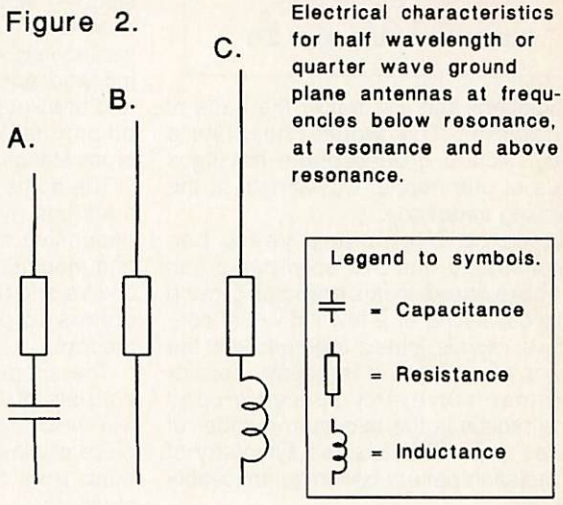
The signal radiation angle is also a function of the angle between the arms or radiator and ground plane, however other factors also influence the predictability of the radiation angle (especially in the HF bands including 27MHz) — like the antenna's height above the real ground.

For the sake of the quarter-wave ground plane project this issue we will remove the hit-and-miss character by building a **tuned radial ground plane** antenna.

The ideal tuned ground plane antenna would be a vertical metal radiator with an infinite number of quarter-wavelength radials connected together at the feed point, which would

....☞

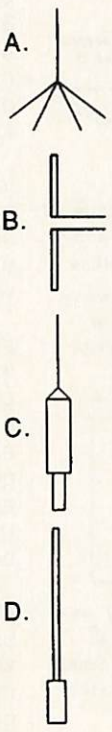
Figure 2.



Electrical characteristics for half wavelength or quarter wave ground plane antennas at frequencies below resonance, at resonance and above resonance.

Shortened antenna at 'A' appears resistive with some capacitive reactance in series while antenna at 'C' appears resistive with some inductive reactance in series with the resistance. Antenna 'B' is resonant at the operating frequency and exhibits only pure resistance to the transmitter.

Figure 3.



A. Quarter wave groundplane antenna. Clumsy & space consuming. Efficient, easy to feed with coax. Radiation angle dependent on position of radials

B. Centre fed dipole. Balanced antenna requires balanced feed line. Feedline influences radiation pattern - difficult to obtain omni-directional pattern. Efficient. Useful for side mast mount.

C. Sleeve or co-axial dipole. Heavy and expensive for frequencies like 27MHz. Efficient with omnidirectional radiation pattern & low radiation angle. Easy to mount with unbalanced 50 to 75 ohms feed impedance - suits co-ax feedline. Used most for VHF & UHF.

D. End fed half wavelength antenna. Popular for 27MHz CB. High impedance feed point requiring impedance matching network usually consisting of tapped coil or coil and capacitor. Difficult to build for home constructors. Similar radiation pattern to co-axial dipole above.

THE INVISIBLE CONNECTION

(Continued from page 27)

be adjacent, but just below the base of the radiator. This would constitute a solid, circular ground plane having a radius of one quarter-wavelength at the operating frequency.

Research over many years has demonstrated that this solid plane can be abbreviated to an artificial ground plane consisting of a few individual conductive radials joined together like the spokes of a wheel. It is usually considered that four evenly-spaced ground plane radials is the minimum number of spokes required before the symmetry of the radiation pattern becomes noticeably distorted.

Building a quarter-wave ground plane antenna

Figure 3 illustrates four easily-recognised designs for basic half-wavelength antennas — the **quarter-wave ground plane**, the **centre-fed dipole**, the **sleeve** or **co-axial dipole** and the **end-fed half-wave vertical**, which has found enormous popularity with CB radio operators over the past decade or so.

There is no hard and fast rule for the type of construction required to produce a satisfactory working quarter-wave ground plane antenna. Commercial versions — which seem to be few and far between these days, by the way — are traditionally wrought from aluminium tubing and specially-manufactured hubs and brackets, while some versions even employ stainless steel elements and brass fittings.

The home constructor has a variety of materials available, ranging from quite expensive metal tubing, mobile whips and mounts, to as little as a few lengths of wire and fishing line costing about five dollars to produce the final working product.

The simplest version of the antenna consists of five quarter-wavelengths of wire held together at the feed point by a piece of plastic with the whole assembly hung from a tree or other convenient structure.

A hybrid version can also be produced using a self-supporting quarter-wave vertical radiator or tuned mobile whip antenna and using sloping wire ground plane radials tied in place by lengths of fishing line or similar good electrical insulating material.

For most constructors with a limited range of tools and workshop facilities, the hybrid model using a vertical whip on a commercial mobile mount is probably the most satisfactory combination.

The model shown in the accompanying photograph employs a mobile whip mounting base attached to the readily-available 'mirror' or 'ski-bar' mounting bracket, which will probably cost between $12 and $15 for the two parts. The bracket allows easy clamping to vertical metal tubing or a wooden mast, and will cope with diameters up to about 32mm (1.5 inches).

The vertical radiator can be a loaded or full-size mobile whip, or metal tubing adapted to fit the screw thread or, finally, a supported quarter-wave length of wire.

The commercially-available stainless steel quarter-wavelength mobile whip is an excellent choice because of its durability and long life expectancy, however these antennas have become quite costly in the last few years and may be priced around $100 these days... (There goes the budget!).

The ground plane radials are attached to the mounting bracket using crimp lugs or solder lugs, which are usually available from major hardware or automotive parts stores or electrical suppliers. Since the ground plane radials will be light hook-up wire, or similar on this model, care should be taken with the connection arrangement, the idea being not to unnecessarily strain the joints, as the wires can easily experience metal fatigue and break off in a short time.

Light tubing can also be used for ground plane radials, but a means of securely mounting them at the antenna's 'hub' must be fabricated. Clamping is the preferred mounting method for tubular radials, because drilling through the element can seriously weaken the metal. If you decide to drill the tubing and use screws to attach the radials it will be necessary to use shaped washers or some other means to reinforce the metal around the hole.

The *electrical* length, as opposed to the *physical* length, will vary a little depending on the thickness of the main radiating element, with the effect less noticeable on the ground plane radials. Thicker elements will be electrically longer, so they must be shortened by up to several per cent to compensate for the difference in length to diameter ratio.

Quarter-wavelength calculation

A 'near enough' value for one quarter wavelength at the desired frequency should be given by the following calculations.

To find the length in inches - divide 2808 by the desired frequency in MHz.

To find the length in centimetres - use the number 7132 by the frequency in MHz.

For 27.250MHz CB the results will look like this.

2808/27.25 ≈ 103 inches

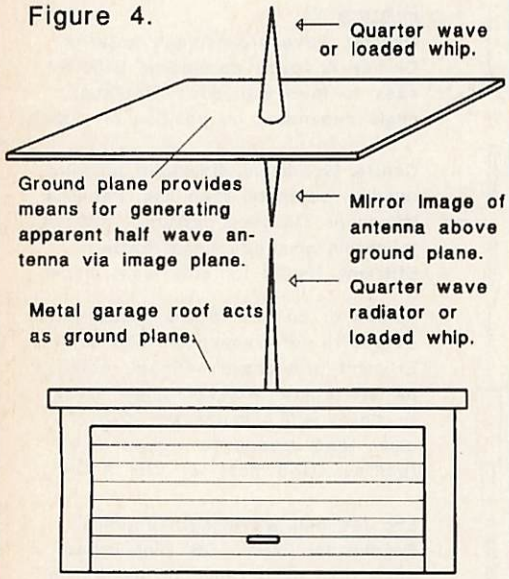
7132/27.25 ≈ 261.7 cm

The lengths given here are approximate and may vary a little depending on the builder's construction techniques, however fine tuning of the element lengths really should not be necessary — but perfectionists can mess about for hours if they wish.

Essentially, flat ground planes like a garage roof or the like, are unlikely to produce a SWR of less than 2:1 because of the lower inherent feed impedance of this configuration, so it is recommended that ground plane radials 'drooped' between 30 and 40 degrees from horizontal should be considered. This usually makes antenna construction easier for those using thin wire radials secured with nylon fishing line or the like.

Another way of producing the vertical radiator is to strip back the outer jacket and braid from a length of RG-58 coaxial cable and use the exposed insulated, inner conductor at the radiator. If you

Figure 4.


Quarter wave or loaded whip.
Ground plane provides means for generating apparent half wave antenna via image plane.
Mirror image of antenna above ground plane.
Quarter wave radiator or loaded whip.
Metal garage roof acts as ground plane.

Untuned ground planes should preferably exceed one quarter wavelength radius in all directions from antenna mounting point. Small groumd planes usually reduce radiation efficiency and make antenna tuning difficult.

don't mind the tedious, fiddly job of carefully unravelling the braid, it is possible to use the braid strands, re-twisted together in smaller clumps, for the ground plane radials.

An easy and efficient way to re-twist the braid strands is to stretch them out carefully and, *by hand*, twist them together for a few centimetres at the far end. Insert the clump into the chuck of a small hand drill and stretch firmly while the strands are re-twisted.

It is best to use a hand or battery-powered drill for this job as it is easy to lose control with high-speed power drills. Remember, the tighter you twist the strands the shorter the length will become, so keep an eye on the length as you go to avoid having to join on an extra length of wire.

If you decide on coaxial cable to build your antenna, just a few points to bear in mind:

• The vertical radiating element should be supported by a length of wood or plastic, or if you decide to 'hang' the antenna from a tree or other suitable structure, use a strong thread bound to the element along its length to avoid 'stretch' of the inner conductor and its sheath.

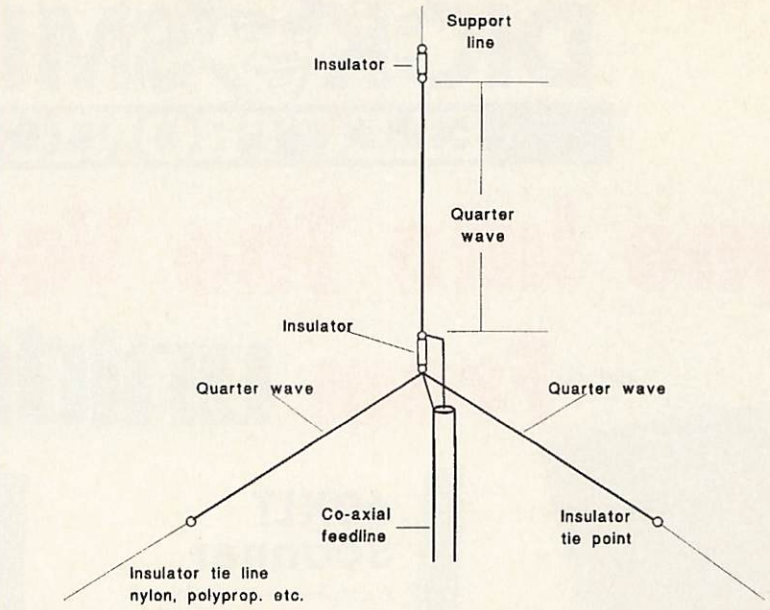
• As usual, don't use long lengths of unsupported coaxial cable, for the same reason — the cable can suffer considerable elongation, especially in hot weather.

• A minimum of four ground plane radials, evenly spaced symmetrically (in a 'cross' configuration) is preferred, however a greater number of radials will produce a more even radiation pattern. Some interesting directional results can be obtained by 'lop-siding' the ground plane symmetry and even reducing the number of radials down to one or two radials strategically placed to one side.

Aluminium manufacturers like ALCAN and COMALCO produce a range of light tubing in sizes which 'telescope' snugly together. These sizes may not all be carried by your local dealer, so it is best to contact the manufacturers or your local outlet for advice on availability of the tubes.

This type of element construction has great potential especially for ease of length adjustment. The final element lengths can be locked by using small screws or by slotting one end of the tube with a hacksaw blade and using a suitable size hose-clip to clamp the outer tube to the smaller inner tube. See **figure 5**.

Next issue we will consider building a **half-wave end-fed vertical base station antenna** for 27MHz. Until then...



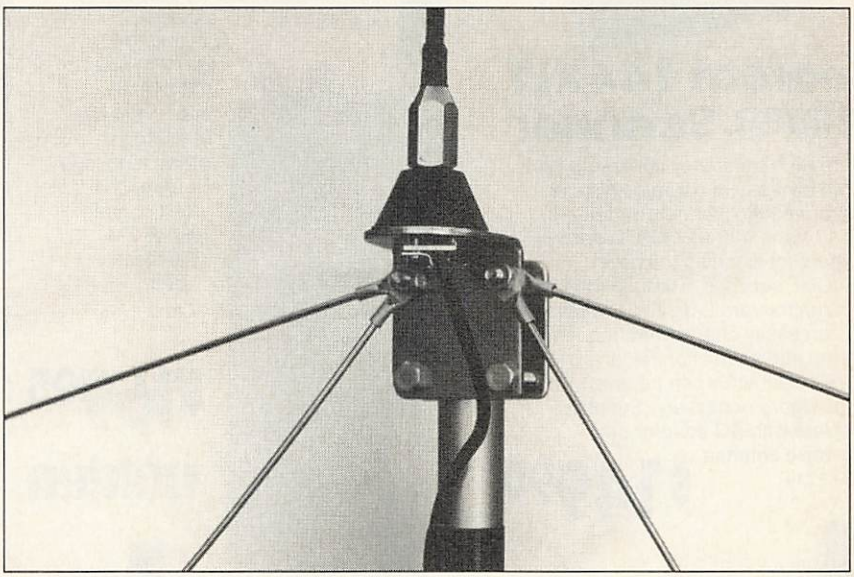
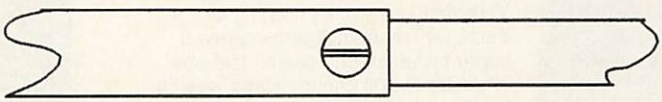


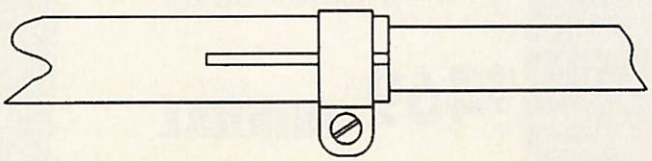
Figure 5.

JOINING TOGETHER LENGTHS OF TUBE.



Set tubes in position. Cross drill with appropriate size drill lock together using self-tapping screw or similar.

Slot larger tube with hacksaw blade and insert smaller diameter tube to correct length. Fit suitable size hose clip and secure.



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Uniden 120XLT Scanner

Provides nine-band VHF/UHF coverage including airband, 100 memories, and improved super fast scan and search features (scan up to 100 channels/sec, search at 100 or 300 steps/sec). Covers 66-88MHz, 108-174MHz, and 406-512MHz. Also features 10 priority channels, data skip and memory back-up. Complete with NiCad battery pack, AC charger and detailed instructions.

Cat D-2752

$369

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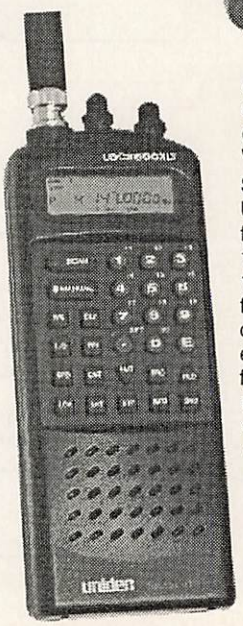
Uniden 220XLT Scanner

The Twin Turbo 220XLT hand-held scanning receiver provides ten-band VHF/UHF coverage including air band, 200 memories and improved super fast scan and search features (scan up to 100 channels/sec, search at 100 or 300 steps/sec). Also features pre-programmed channel steps to suit Australian conditions, including 800MHz. Complete with NiCad batteries, AC charger and detailed instructions.

Cat D-2755

$469 uniden.



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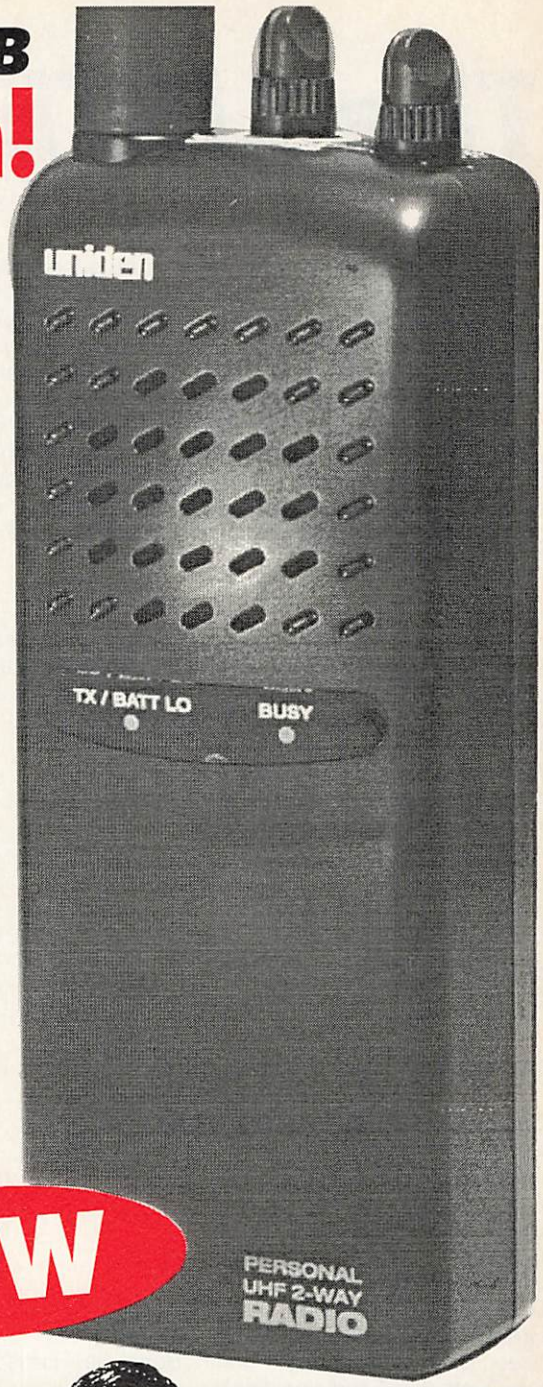

New for 1995! The Uniden UH-053 answers the needs of users who require a compact FM transceiver for communication over short-medium range local areas, without the complexity and expense of existing high-power hand-helds.

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Each UH-053 is supplied with a NiCad battery pack, AC charger, belt-clip, and flexible antenna, ready for operation. An optional speaker/microphone (D-2025) is also available for more convenient belt-mounted usage.

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The LISTENING POST

Gosh, thanks!

I was quite pleased at the number of letters we got here at The Listening Post just to tell us how much you'd enjoyed CBA through the past year and wishing us all the best for Christmas and 1995. I'm grateful that we're doing the right thing so much of the time, or so it seems, although the column wouldn't be nearly as accurate, as interesting or as much fun to put together without the assistance of our Listening Post team, from past master Russell Bryant (and he thought he'd enjoy a quite retirement — *hah*!) all the way down to that great gang on scanner-fans online at computer bulletin boards such as Shortwave Possums, Spectrum and The Radio Shack.

Shopping around

After last issue's look at shopping center frequencies around the country, we received an armload of data for NSW centres — thanks to Bob Haile, Martin Howells and Alex Wellner for this great batch to keep the shoppers scanning and the scanner nuts shopping!

AMP Shopping Center (Bondi Junction)	486.025
AMP Shopping Center (Kotara)	465.250
AMP Shopping Center (Ryde)	489.275
Australia Square (Sydney)	450.025
Bankstown Square	471.150
Big W (possibly NSW-wide)	458.075
Big W Canberra	450.025
Birkenhead Point	469.650
Bonyrigg Plaza	471.300
Castle Towers	469.675, 471.525
Charlestown Square 'Courtesy Crew'	471.625, 471.900
Charlestown Square security/maintenance	474.950
Coles (Bondi Junction)	450.400
David Jones (NSW-wide)	474.975
Eastgardens	157.840
Garden City (Newcastle)	468.250
Gateway	450.275
Grace Bros (North Ryde)	463.625
Grace Bros (Parramatta)	450.425
Grace Bros (Sydney, Roselands, Mt Druitt)	469.900
Grace Bros (Wollongong, Penrith, Hurstville, Hornsby, Brookvale and Bondi Junction)	463.550
Harbour Park (Manly)	471.825
Harbourside (Darling Harbour)	472.475, 520.025
Hills Shopping Center	471.600
Lend Lease Shopping Centers (NSW-wide)	474.950
Maroubra Mall	475.075
Macarthur Square	450.025
Macquarie Shopping Center	489.275
Maitland Plaza	493.400
Marketown Blacktown	474.825
Marketown Center management	469.675
Marketown Mt Druitt	469.675
Metro Shopping Center (Marrickville)	509.925
MLC Center (Sydney)	463.200
Penrith Plaza	487.650, 450.300, 450.275
Stockland Mall and K-Mart (Jesmond)	450.025
Stockland Mall and K-Mart (Merrylands, Maroubra, Baulkham Hills)	475.075
Tamworth Shopping World	169.1125
Warringah Mall	475.075
Warringah Shopping Center	166.810
Westfield (Belconnen)	488.725
Westfield (Hurstville)	471.150, 469.500
Westfield (Liverpool)	469.675, 469.500, 463.625, 463.150
Westfield (Warrawong, Parramatta, North Rocks, Hornsby, Chatswood, Botany East)	469.500
Westfield (Miranda)	469.500, 465.200, 463.500
Ryde Shopping Center	463.625

Quick takes...

Stephen Newlyn has more details on the new SA Police D6 area of north of Adelaide. "The suburbs covered include Bolivar, Burton, Direk, Dry Creek, Greenfields, Paralowie, Parafield Gardens, Salisbury, Salisbury Downs, Salisbury North and St Kilda," he advises. "Both the D1 and D6 areas will be known as the Para Division, Para Hills is heard as Delta 1 and Salisbury station as Delta 6."

Matthew Volkmer advises that the local airband channel used by Adelaide Control (Arrivals) has changed from 127.100 to 127.050, due to interference with other nearby allocations.

Regular reader Bob Haile wonders if any readers have the frequencies for the Lube Mobile mobile mechanics, and Harris Park Transport Company, a private bus operator in western Sydney.

To CD, or not CD?

Bob also offered this observation about the SMA's CD-ROM of frequency allocations:

"Scanning is my main hobby, and sitting down and looking through frequency registers for sometimes hours is just part of the hobby. If I get the CD I just type in what I am looking for, and I have it. I think the CD is a good idea, but for me the books are best."

And that's exactly right: for some people the SMA CD-ROM is the ideal research tool, but you miss all the fun of those other little discoveries and insights along the way when you're leafing through page after page of allocations.

There's certainly more to scanning than just plugging in a string of numbers, hitting the Enter key and sitting back. It can be that simple, if that's all you want out of it — but there's a *lot* yet to discover out there!

Caught in the act...

An interesting snippet landed on my desk (well, okay, my electronic IN tray!) from the international newswire services right at the end of last year. A Memphis woman listening to a scanner she had received for Christmas happened across

up a cordless phone conversation and heard what turned out to be a murder plot in the making. The article explains that a Ms Donna McGee heard a woman and what appeared to be her boyfriend plotting to kill the woman's husband so they could collect his life insurance. As the family gathered around in horror, the report continued, Mrs. McGee's daughter recognised a playmate's name and the family soon figured out the identity of the intended victim.

"Law enforcement officials said that because Mrs McGee was not purposely zeroing in on a specific conversation but only scanning across the bands," the report continued, "she had broken no laws in listening to the murder plot."

Airband action in the Apple Isle...

This next batch is from our man in Tassie, Jason Reilly, and should put local airband enthusiasts into the picture:

40.680	Federal Airports Corporation, Hobart Airport
118.100	Hobart Tower
118.700	Launceston Tower
120.700	Melbourne FIS at Devonport Airport
122.100	Melbourne FIS at Hobart
122.600	Melbourne FIS at Wynyard/Burnie
123.800	Melbourne Control at Mt Barrow
123.900	Melbourne FIS at King Island
124.100	Melbourne FIS at Mt Read
126.500	Melbourne FIS at Mt Barrow
128.900	IPEC Transport
129.500	Qantas
130.600	Ansett
463.675	Ansett Air Freight, Hobart airport
466.375	Aviation Fire Fighters, Hobart and Launceston
466.500	Ansett, Launceston Airport
486.675	Mobil Aviation Fuellers, Launceston Airport
484.550	Qantas, Hobart and Launceston Airports
490.150	Federal Airports Corporation, Hobart and Launceston Airports
494.825	Federal Airports Corporation, Hobart and Launceston Airports

The Tasmanian Police also have a low power repeater on 468.225 which can be activated as needed.

...and Adelaide

Here are some 'company channels' for Adelaide airport, courtesy of Stephyn Newlyn via the online BBS network:

Ansett	121.7, 130.65, 454.1, 454.7, 463.6, 464.2
Australian Air Express	409.65, 410.25, 419.1, 419.7
BP	71.45
CAA	456.65, 474.425, 479.625, 466.15
Cathay Pacific	455.85, 465.35
FAC	473.15, 478.35
Garuda Airlines	453.65, 463.15
Kendell Airlines	135.55
Lloyd Helicopters	126.4
National Jet Systems	128.9
SA Police helicopter	131.6
Qantas	121.7, 129.5, 131.9, 455.45, 464.95, 484.55
Ross Aviation	128.9
SA Bureau of Meteorology	151.5
Security Express	452.85, 462.35
Skywest Aviation	135.95
TNT	126.4, 491.6, 491.975, 492.175, 492.2, 495.1, 496.8, 497.175, 497.375, 497.4

RTA NSW

Michae Evans has dug up this very complete and up-to-date list of frequencies for the NSW Roads and Traffic Authority. Michael has plenty more like these online at his great Spectrum Radio BBS in Melbourne.

Armidale	
167.5300	
Bald Hill	172.5900
Bald Hill	172.6500
Bald Hill	875.0875
Ballina	451.5000
Balranald	404.0250
Balranald	404.1500
Bangalore	165.1125
Barrat	165.1500
Barrat	460.0250
Barrat	460.3000
Bega	167.5900
Bega	461.0000
Bellambi	167.6050
Bellambi	450.7000
Bellambi	450.9500
Belrose	172.5900
Belrose	450.5500
Big Talbingo Mountain	460.4000
Bingie Grumble	149.6750
Black Trig	460.4000
Blakehurst	853.5187
Blakehurst	853.5812
Blakehurst	929.5187
Blakehurst	929.5812
Bomaderry	167.6200
Booberoi Hills	165.1125
Booberoi Hills	450.8000
Booligal	150.0625
Boona Mountain	404.9250
Bowenfels	167.6050
Box point	451.2000
Boyne	460.9500
Broken back	165.1500
Broken back	928.0625
Broken Hill	451.4500
Bulga	162.9375
Cabbage Tree Mountain	928.1125
Cooma	167.5600
Coonabarabran	167.5900
Coronga	450.5500

....☞

The LISTENING POST

Coronga	450.6250	Mt Canobolas	461.0000	Sunny Corner Trig	165.0875
Coronga Peak	172.6500	Mt Canobolas	165.1625	Sunny Corner Trig	451.5000
Cowan	172.6500	Mt Coramba	460.1750	Swansea	172.5750
Cowan	460.0500	Mt Crony	460.9500	Sydney	167.8300
Cowan	928.6125	Mt Elliott	830.1125	Sydney	455.8500
Deniliquin	154.8750	Mt Gibraltar	460.9500	Sydney	465.3500
Deniliquin	165.1125	Mt Kaputar	154.8750	Sydney	488.9750
Deniliquin	167.5300	Mt Kaputar	172.6500	Sydney	830.5375
Dubbo	167.5300	Mt Kaputar	450.5500	Sydney-wide	152.4750
Dubbo	928.6125	Mt Magistrate	460.7000	Tambo	172.5900
Euston	413.6000	Mt Mitchell	172.5600	Tambo	450.7000
Finley	167.5300	Mt Mitchell	460.0500	Tamworth	167.5600
Girard	165.0625	Mt Oxley	172.5600	Tamworth	167.5900
Girard	451.2000	Mt Oxley	460.1250	Tenterfield	167.5600
Glebe	156.6500	Mt Robbers	461.0000	The Magistrate	162.9250
Glen Innes	167.5600	Mt Robbers	830.0875	The Magistrate	460.7000
Glen Innes	167.5600	Mt Saddleback	162.9250	The Rookery	413.4750
Goolgowi	404.4000	Mt Saddleback	460.2000	The Rookery	413.7500
Gosford	167.5450	Mt Sugar loaf	875.1125	The Spit	465.3500
Goulburn	160.5125	Mt Torah	167.7700	Tin Mine Trig	451.2000
Granville	167.6200	Mt Torah	875.1125	Trilby Park	172.5900
Gundaline	413.7500	Mt Torah	875.5375	Trilby Park	450.5250
Gundaline	413.8500	Mt Tomakin	165.0750	Tumut	160.4625
Harwood Bridge	165.0750	Mt Tomakin	852.2625	Turpentine Range	451.4500
Harwood Bridge	461.0000	Mt Yaren Trig	162.9375	Tweed Heads South	167.5750
Hay	154.6625	Mt Yaren Trig	460.4000	Uralla	451.4500
Hay	404.3000	Mullengudgery	150.1000	Wakefield	168.9100
Hay	450.8000	Mullengudgery	172.6200	Wardell	165.1875
Herveys Range	404.9250	Mullengudgery	404.9250	Wardell	451.5000
Holbrook	460.9500	Narrandera	450.5250	Welby	167.5300
Horsley Park	172.6200	Needle Mountain	404.9250	Wilson's Valley	167.5600
Horsley Park	852.6125	Needle Mountain	460.0250	Windsor	830.1125
Jerilderie	164.4700	Neutral Bay	853.5187	Wollongong	450.7000
Jerilderie	460.2500	Neutral Bay	853.5812	Wollongong	450.9500
Kadina	165.1875	Neutral Bay	929.5187	Wollongong rea	168.9100
Kalkite	875.0875	Neutral Bay	929.5812	Wolumla Peak	165.1125
Kiandra	167.5600	NSW-wide	151.0500	Wolumla Peak	414.4750
Kotara Heights	172.5750	NSW-wide	469.7000	Yamba Trig	451.4500
Kyeamba	162.9250	NSW-wide	495.1750	Yambla Trig	404.2000
Kyeamba Gap	413.6500	Orange	167.5600	Yass	167.5600
Lawson	160.5875	Parkes	167.6200		
Loftus	172.6500	Peak Alone	165.0750		
Maddens Plains	460.4500	Peak Alone	165.1500		
Maddens plains	462.0125	Peak Alone	405.0250		
Mairjimmy	165.0750	Peak Alone	451.5000		
Mairjimmy State Forest	149.6750	Port Macquarie	167.6200		
Mairjimmy State Forest	450.7500	Saddleback Mountain	460.2000		
Malebo Hill	450.8000	Saint Helena	165.1625		
Malebo Range	165.0875	Saint Helena	451.5000		
Middle Brother	852.1125	Saint Helena	461.0000		
Milbrodale	852.0625	Saint Helena	928.2625		
Minjary Trig	165.1875	Asp Bulga	165.1500		
Minjary Trig	450.9000	Asp Bulga	414.3750		
Moree	167.6200	Asp Bulga	852.6125		
Mount Walker	450.6750	Asp Bulga Trig	414.3750		
Mt Boppy	154.7000	Shire Council radio site	172.6050		
Mt Boppy	172.5600	Singleton	167.5300		
Mt Boppy	460.0500	South Tamworth	167.5600		
Mt Boppy	460.2000	Stewarts Sandhill	460.3000		
Mt Cairncross	928.1125	Summit Mountain	450.6750		

Shire Councils in Victoria

Not being content with just the above Michael has gone for a digital dive into the SMA CD-ROM database and produced this gem of a list of Shire Councils in Victoria:

Alberton	461.200
Alexandra	157.870
Arapiles	162.610
Ararat	35.010
Ararat	37.010
Ararat	450.075
Avoca	39.175
Avon	158.080
Bacchus Marsh	151.050
Bairnsdale	79.300
Bairnsdale	81.800
Ballarat	167.500
Bannockburn	166.570

Compiled by David Flynn

Bass	461.450
Benalla	157.900
Benalla	162.500
Bright	79.150
Bright	404.025
Bright	413.475
Broadford	72.860
Bulla	168.670
Bulla	405.00
Bulla	414.450
Buln Buln	491.475
Buln Buln	496.675
Buninyong	473.750
Buninyong	478.950
Charlton	474.300
Cohuna	157.925
Cohuna	162.525
Colac	74.270
Colac	404.275
Colac	413.725
Corio	40.680
Corio	490.700
Cranbourne	150.1625
Creswick	161.440
Daylesford & Glenlyon	473.700
Daylesford & Glenlyon	478.900
Deakin	167.830
Diamond Valley	150.9125
Dimboola	159.300
Dimboola	163.900
Donald	470.125
Donald	475.325
Dundas	152.700
Dundas	450.550
Dundas	460.050
Dunmunkle	158.080
East Loddon	77.480
Eltham	150.6125
Eltham	404.875
Eltham	414.325
Euroa	157.5875
Euroa	162.1875
Flinders	162.925
Flinders	857.9375
Gisborne	158.770
Glenelg	77.5125
Gordon	76.310
Goulburn	73.070
Goulburn	167.770
Hampden	159.650
Hampden	164.250
Hastings	87.600
Hastings	150.2125
Heytesbury	157.7375
Heytesbury	162.3375
Heywood	167.080
Kara Kara	77.780
Karkarooc	158.440
Kerang	158.9875
Kerang	163.5875
Kilmore	162.700
Korong	160.525
Korong	165.125
Korumburra	81.570
Kowree	74.330
Kyneton	158.3375
Kyneton	162.9375
Leigh	474.075
Leigh	479.275
Lillydale	171.600
Lillydale	173.280
Lowan	166.510
Maldon	71.450
Mansfield	493.150
Mansfield	498.350
McIvor	161.410
Melton	150.575
Melton	454.600
Melton	464.100
Mildura	38.9250
Mildura	38.9250
Mildura	150.800
Mildura	156.00
Minhamite	165.940
Mirboo	165.125
Mornington	162.350
Mortlake	474.100
Mortlake	479.300
Mount Rouse	453.500
Mount Rouse	463.00
Myrtleford	158.080
Nathalia	162.100
Newstead	158.080
Numurkah	157.540
Omeo	169.300
Omeo	169.780
Orbost	165.940
Orbost	451.100
Orbost	460.600
Otway	159.880
Oxley	159.300
Oxley	163.900
Pakenham	163.725
Pakenham	405.025
Pakenham	414.475
Phillip Island	167.650
Ripon	494.100
Ripon	499.300
Rochester	74.00
Rochester	404.025
Rochester	413.475
Rodney	77.950
Romsey	167.650
Romsey	450.275
Rosedale	494.300
Rosedale	499.500
Rutherglen	158.875
Rutherglen	163.475
Seymour	158.770
Shepparton	493.650
Sherbrooke	151.0625
Sherbrooke	152.9875
South Gippsland	150.9375
Strathfieldsaye	169.630
Swan Hill	404.100
Swan Hill	404.125
Swan Hill	413.550
Swan Hill	413.575
Swan Hill	473.300
Swan Hill	479.400
Talbot & Clunes	158.050
Tallangatta	77.870
Tambo	35.030
Tambo	35.250
Tambo	450.950
Tambo	460.450
Traralgon	173.940
Tungamah	158.560
Upper Murray	126.700
Upper Murray	173.190
Upper Murray	498.575
Walpeup	73.910
Wangaratta	157.930
Wannon	77.090
Waranga	75.590
Waranga	451.300
Waranga	460.800
Warracknabeal	473.925
Warrnambool	165.790
Warrnambool	451.075
Warrnambool	460.575
Whittlesea	150.1375
Whittlesea	450.025
Wimmera	491.500
Winchelsea	162.460
Winchelsea	166.360
Woorayl	169.630
Wycheproof	484.175
Wycheproof	485.825
Wycheproof	489.375
Yackandandah	81.540
Yackandandah	150.350
Yackandandah	154.950
Yarrawonga	158.560
Yea	157.780
Yea	451.125
Yea	460.625

The only problem with those, of course, is that Victorian cities and shires are amalgamating as fast as their corporate legs will carry them, so there may be quite a bit of change in this area over the next year or two...

Well, why are you still *sitting* there? There's a whole lotta reading in the rest of this mag, and a whole lotta scanning to be done! If you find something new, or something interesting, don't forget to write to and let us know, at PO Box 24, Glenbrook, NSW 2773.

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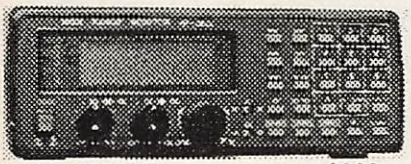

Uniden 120XLT	$369
Uniden 220XLT	$449
Uniden 2500XLT	$579
AOR AR-1000	$649
AOR AR-2800	$749
AOR AR-1500	$679
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Oritron KU Band CX101 1dB	$244
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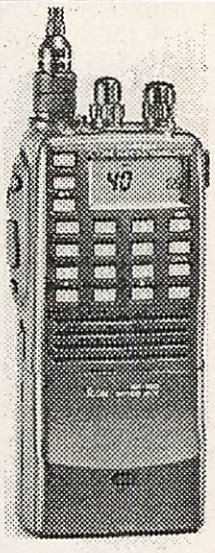

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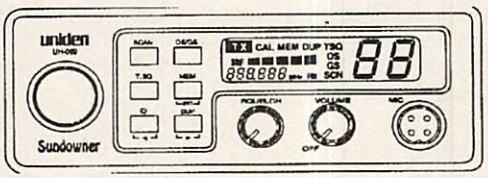

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Frequently Asked Questions about...

CB, SCANNING, SHORTWAVE LISTENING

**** Where can I learn more about radio?***

If you like what you see here and want to learn more about the technical aspects of radio, you may be interested in getting an amateur ("ham") radio license. These licenses are available in almost every country in the world, including all of the countries that have CB.

Amateur radio is very different from CB.

This is neither good nor bad - they have different purposes. With the training that a licensed amateur radio operator is expected to have, much more powerful transmitters are allowed - but the operator should know when that power is not necessary and refrain from it. Amateurs have no limits on the range of their communications (at least, by law or treaty) so it is possible to make distant "DX" contacts using atmospheric skip, satellites, or even bouncing signals off the Moon.

Again, training and the willingness to cooperate (to avoid interference with others) are necessary for obtaining and using these privileges.

In what may become a trend in other countries, Sweden and the USA have authorised a new amateur radio "no-code" license which requires only a written test (no morse code). However, the test is challenging enough to necessitate several weeks of study. Australia was expected to have a similar no-code" licence by now but we're still waiting.

Even if you don't want the licence, books intended for amateur radio operators make available a wealth of information on understanding transmitters, receivers, antennas, modulation, signal propagation, electronics, and many other topics which also apply to CB.

You should of course also read our sister publication Amateur Radio Action which naturally enough concentrates on amateur news and information. It's on sale every month at a cost of $3.95.

**** What should I consider when choosing a location for my antenna?***

The answer to this question differs greatly between base and mobile installations.

Each will be answered separately.

In mobile installations, things to consider are whether you're willing to drill holes or use a magnet mount, gutter mount, boot mount, or a bumper mount. If you say "no" to all of those (which would probably mean you have a very nice car) your list of options is pretty short - use a handheld with a rubber duck antenna.

Otherwise, you can start making choices with the following things in mind:

1) The closer your antenna is to the top & centre of the vehicle, the better.So the roof is better than the rain gutter or boot and all of those are far better than the bumper. But they'll all work.

2) A drilled/permanent mount is better than a magnet mount in the same location. (This is so that the antenna gets a better "ground plane".) If you use a magnet mount, run your coax feed line through the door or hatch that gets the least use and then leave it alone. Don't use any path where the coax would get pinched.

For base installations (i.e. at home) the best places are "as high as you can" within legal limits. The roof is normally fine.

If you're in an apartment complex, you may be limited to a balcony but ask the manager - they may just want you to keep it "invisible." Base station antennas should have a good ground in case of lightning. (In the rare event of a lightning strike, this can mean the difference between burning down the building or just the radio).

Most cold water metal pipes that go into the ground will work. But the best choice for a ground would be an 8-foot (2.4m) copper rod stuck in the ground near the antenna. (If you want to use anything other than the rod for a ground, contact someone knowledgeable about housing construction and safety - you don't want to accidentally use a hot water or gas pipe.

**** What are good vertical antenna characteristics for HF CB?***

Antennas have to be designed to transmit and receive on the band that you are using. HF CB is located in the 11-metre band. (They call it that because the wavelength is about 11 metres.) CB antennas range in height from a little under 2 feet (24 inches) up to 108 inches.

The 1/4 wave whip (108") will offer better reception and transmission capability over a shorter, coiled or "loaded" antenna.

VERY short antennas, or multiple antennas that aren't "phased" properly will result in a very poor signal. Remember, for co-phasing antennas, they must be 1/4 wavelength apart which, for the 11 metre band, is around 9 feet. Most cars aren't wide enough to allow antennas to be placed 9 feet apart.

The other characteristic of co-phasing is that it is much more directional than a single antenna. It will transmit and receive MUCH better along the axis of the car than sideways off the car so if you want a omnidirectional antenna, you don't want co-phasing (so you only want one antenna.)

****Why can't I receive all of the broadcasts listed in Monitoring Times/WRTH/Passport/etc.?***

This is a fact of life on shortwave. Because of propagation, antenna headings, the kind of radio you have, your local environment, etc., you're never going to be able to hear all the things you find in a list. The lists in Monitoring Times, etc., aren't lists of what's being heard in a general location. They're lists of everything that you could possibly hear, from a daily powerhouse like the BBC to a once or twice a year rarity like Bhutan.

They're listed because you *might* hear them, depending on where you are and the given circumstances, not because they're necessarily being heard outside of their immediate target area. If you want lists of what is actually being heard in something roughly analogous to "your area", the best source for these are the logging sections of the bulletins of the SWL/DX clubs.

You might want to sample a few club bulletins to see if they'll help.

The bulletins also offer articles from experts on many facets of the hobby. You can of course also read our regular DX Log column by Rob Williams and/or Craig Seager's SW Notes in Amateur Radio Action.

Address your questions to:
FAQ, PO Box 622, Mount Eliza 3930.

Getting started in satellite TV or you can have...

KU and C-Band Satellite TV for less than $2,000

By Ken Reynolds

In the world of personal radio technology there is little to compare with the first time you point your 'dish' skyward in search of that pin-point signal source that will open the door to a whole new world of entertainment and information services.

The needle on your 'satellite finder' flicks up and subsides. The hissing sound from your TV loudspeaker quiets briefly and a snowy picture flickers into life and just as quickly dies again. Your pulse quickens, and in this brief moment you know it can be done. In fact you've *done* 'IT'.

Until this moment you weren't really sure if there was anything 'out there' at all. But now you know. You've seen it. You've done it. The excitement is gripping, the anticipation compelling. The challenge is conquered. You've just crossed over into the world of satellite TV!

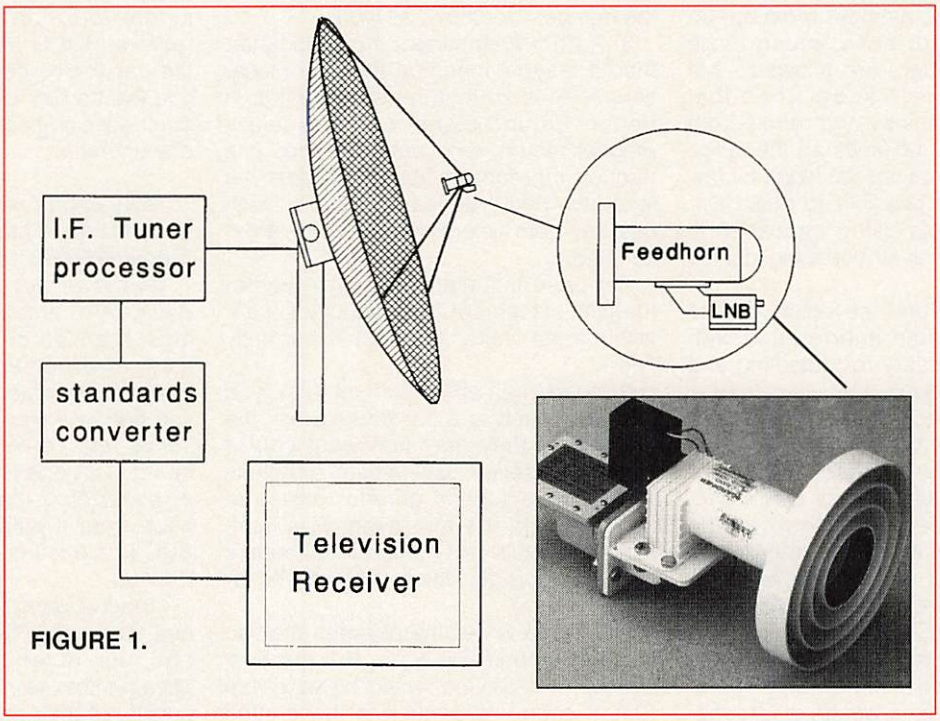


FIGURE 1.

And now, every time you find a new satellite you are in for the same 'buzz'. Exploring the transponders, hoping, always hoping for the jackpot. Scanning thousands of megahertz in search of that rare event. Discovering that new signal that wasn't there yesterday and identifying its source. Some new sources will offer addresses and phone or fax numbers where you can get the latest information on their operation.

Some sources will be encrypted or operating on a different transmission standard like NTSC for American programs or SECAM for French and Russian broadcasters.

Satellite TV DXing is really just an extension of scanning, short wave listening or even CB operating for that matter; except you quickly develop a feel for the newest, leading-edge technology while dramatically expanding your information and entertainment horizons.

I probably don't need to tell you that with a modest 'ground station' for satellite TV reception you will view, hear and experience events that will enrich and touch your life in many ways; and, on occasions, even the toughest viewers will be stunned by the brutal honesty of on-the-spot news gathering facilities at their disposal.

Through the magic of satellite TV we were 'there' for hours when Rabaul was buried under tonnes of volcanic ash, when cyclones stormed and raged around the globe, in close-up when helpless, wounded troops were executed where they sat in South Africa — in fact, anywhere where world news is continuous and where country and western entertainment in hi-fi stereo just keeps on a'comin'.

What you need to get started

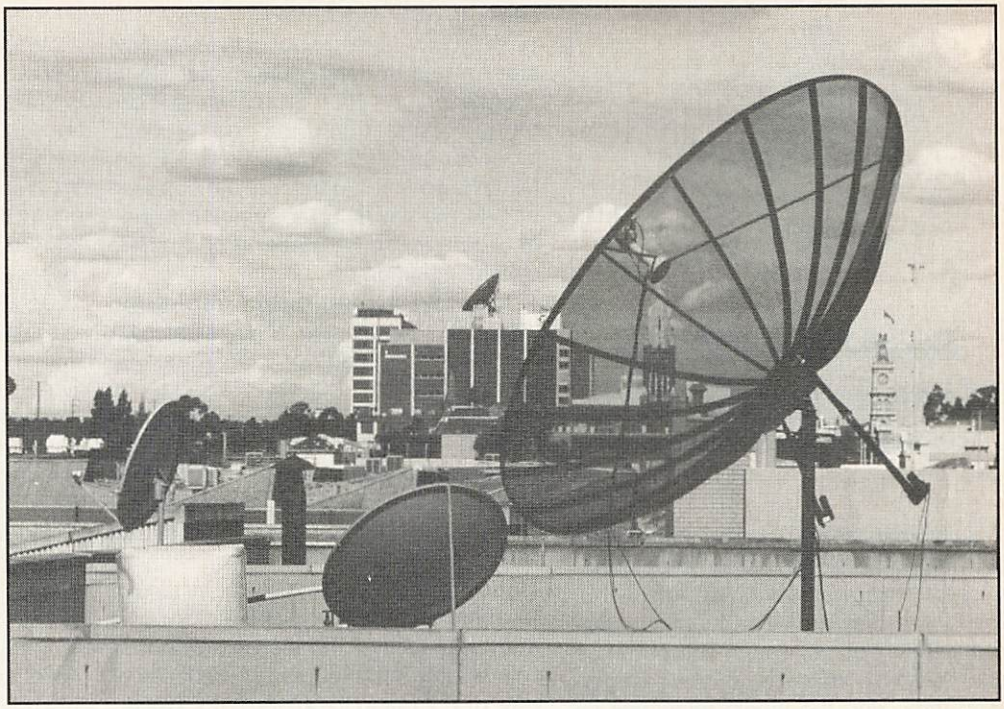
Getting started in satellite TVRO (TV Reception Only) does not need to be as expensive as most newcomers think, and it's getting easier and cheaper all the time. While you can easily spend more than $15,000 on receiving equipment to put you in the big league, for less than $1,000 you can put together quite a sound little system whose usefulness will quickly increase as more and more satellite services come on line.

For less than $2,000 you can be in business on both KU-Band and C-Band — and that is less money than you would spend on a really flash scanning receiver!

The TV receiver

Most viewers already own the most expensive part of the system — the television receiver itself. You don't need a special TV set, as many people think, for receiving satellite pictures. However, if you are thinking of buying a new TV receiver it is well worth considering one of the new multi-standard receivers which can tune-in NTSC and SECAM standards as well as the Australian PAL standard signals.

The Australian **Optus B** series are



Invisible from the street, a formidable array of Satellite antennae (foreground) aim skyward to the Clarke Belt. From left to right 1.8m offset dish, 1.6m offset dish and a 4m KU Band mesh dish with polar mount and activators. In the background, about 2km distant is Telstra's massive 'eye-on-the-sky'.

KU-Band satellites and, from time to time, these carry NTSC transmissions which appear on your standard telly as a black and white (monochrome) picture with a fast vertical flicker rate. If you have a multi-standard receiver you will receive these signals as proper color pictures without any extra standards conversion equipment.

Antennas

Figure 1 shows a block diagram of a basic satellite TV ground receiving station. Starting at the antenna, you will need a parabolic dish antenna which acts as the signal collector. Larger antennas are more effective, but cost more money, are heavier and occupy more space.

The suggested minimum size dish diameter is about one metre or a little larger for your basic station setup. However, we have had some quite good results from Optus B1 satellite using a 60cm diameter offset dish antenna... but if you choose one of these you can only expect to receive good signals from the higher power transponders. Many other desirable signals will be out of reach for the smaller antennas, so bigger is better when it comes to SAT TV signals.

LNBs and feedhorns

Like the mirror in an optical, reflecting telescope, the dish antenna directs most of the collected energy onto a predetermined focus point. Instead of viewing the resultant image directly with your eye, the energy is collected by a 'feedhorn', which is usually an integral part of the first active receiver element known as a **Low Noise Block**, which is sensibly abbreviated to **LNB**.

Domestic satellites are generally confined within two frequency bands: **C-Band**, operating between 3.7GHz and 4.5GHz, and **KU-Band**, stretching between 9.5GHz and 12.2GHz. The term GHz is the abbreviated form of gigahertz and 1GHz is equivalent to 1000MHz or 1,000,000,000 cycles per second. Gigahertz are affectionately known as 'gigs' throughout the industry. Because of the vast difference in frequency between C-Band and KU-Band separate LNBs are normally used for each band.

The LNB contains some very specialised receiving circuitry which produces high amplification — between 100,000 and 2,000,000 times — of the incoming signals but introduces only a tiny amount of extra noise. CBers will already know that noise of any type is the biggest threat to good reception.

Noise in a television system usually appears as a 'snowy' picture and tends to affect the vision carrier before it is noticed in the audio. Noise on the picture is known by TVRO users as 'sparklies', and they can come from within your system or without.

The LNB also provides a frequency conversion which 'down-converts' the incoming weak signals to a medium level intermediate frequency (IF) band of between 950MHz and 2050MHz which is easier to manage.

This allows the use of quite inexpensive co-axial cable between the output of the LNB and the tuneable part of the receiver system.

UHF operators, whose continual challenge is to avoid the considerable signal loss due to coaxial cable attenuation, will appreciate this idea.

The tuner

The LNB amplifies and down-converts the whole block of satellite frequencies as a single 'package', which is then presented to the tuner via a length of 75 ohm coaxial cable. Because this intermediate frequency signal has been amplified by up to 65dB the level is now quite high, and it can be fed to the tuner through a considerable length of cable with only minimal degradation. However, it should be borne in mind that at frequencies of around 1000MHz the cable is still quite lossy, and minimum length runs of cable are desirable. The tuner is the 'user interface', and this is about the only point in the chain where the operator has any real control over the decoding and demodulation processes, so the selection of a suitable tuner bears considerable thought. Tuners range in price from a few hundred dollars to several thousand dollars, and offer a wide range of user accessible features. At this stage of evolution some of the more sophisticated tuners are only slightly more expensive than the basic 'manual' tuners and, unless you are really strapped for cash, units offering up to 200 memories and IR remote controls easily represent the best value at around $500. Satellite TV transmissions can have many variables which I won't tackle in this introduction to SATTV, however the tuner which offers the greatest operator control will probably see you comfortably set up for the next few years.

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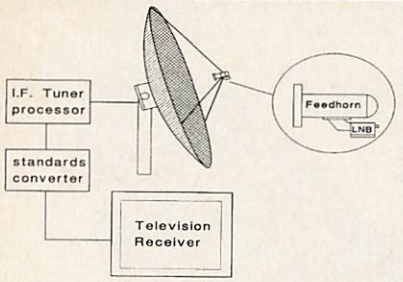


Satellite TV for less than $2,000

(continued from previous page...)

A typical $500 tuner will offer what appears to be a formidable range of on-screen programmable features... but fear not — they are all pretty much commonsense options which will enhance your system's ability to get the best performance, and the whole show will be easier to operate than most VCRs.

A SATTV tuner will usually offer several options in getting the output signal information into your TV set where it can be demodulated into the final product. Most tuners these days offer RF out (just like your VCR) that can be connected into the TV receiver's antenna socket, where it can be tuned in on a spare channel number.

For TVs having direct audio and video (AV) inputs, the tuner might offer individual video and right and left stereo audio connectors or the whole sequence combined into an international-standard SCART 21-pin connector. Some TV receivers also carry a matching SCART connector. In either case, there will be a combination of outputs available to suit almost any system combination.Satellite TV sound is so good in many instances — approaching CD quality — that it is worth connecting the stereo audio outputs directly into the appropriate jacks of your Hi-Fi system to get the best results.

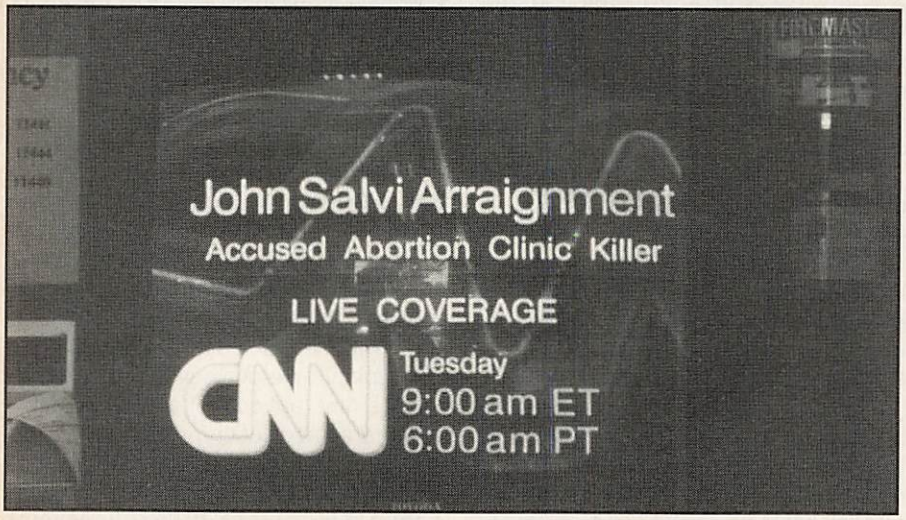
Where are the birds?

When I was a kid — back in the late 1950s — the USSR launched its Sputnik satellite. So, on clear nights after dinner my old man and I would rush outside with high hopes and binoculars to peer heavenward in search of a moving pinpoint of light describing an arc across the evening sky. Sputnik travelled from horizon to horizon so quickly that it was difficult to get a 'lock' through binoculars, so viewing was done for the most part with unaided eyes. Sputnik and its nightly sightings were such important, historical events those days that the newspapers used to carry a timetable of evening passes. Each pass would lasted only a few minutes, but they were repeated several times each night. Our imaginations ran wild with visions of space travel and travelling to the moon and planets, and so on.

Arthur C Clarke, the famous science fiction writer whose imagination ran wild, postulated back in the 1940s a future where radio communications saw satellite repeater/translator stations launched into geosynchronous orbits high above the Earth (22,300 miles) where they would circulate at exactly the same angular velocity as the earth and therefore appear to be stationary in the sky. Clarke was ridiculed as a dreamer...

In 1963 the USA launched SYSCOM 1, the world's first geostationary communications satellite and, by the early 1970s, a fleet of Intelsat III satellites was orbiting the globe over the Atlantic, Pacific and Indian Oceans, providing reliable international radio-linked communications by satellite. There are now more than 100 radio communications satellites in an equatorial arc across the sky, orbiting in what has become known as the Clarke Belt. The satellites themselves are commonly known as 'birds'.

A first satellite target for most beginners will be the Optus B-series birds, as these provide good strong KU-Band signals over most of the continent, and therefore require fairly basic equipment to receive satisfactory signals. Those living in the north of the country have a



Top Left. Self explanatory screen photo direct from CNN news, Statesside.
Below. Direct news feed live from Hong Kong shows intimate details of life in China and Provinces, but urban building demolition techniques vary little between East and West.

veritable smorgasbord available to them from KU- and C-Band birds without needing elaborate equipment to do the job.

Your equipment supplier should be able to assist you in directing your antenna to the right spot in the sky. For each different location on the earth's surface the elevation angle and compass direction will be different, so each case must be treated on individual merits. However, once you find your first satellite, the rest is easy, because the birds are strung out in that equatorial arc across the sky I mentioned earlier. In other words, if you don't have an equatorial mount for your antenna you can still step from one satellite to the next without too much trouble.

A handy piece of equipment for locating the birds and locking onto them is an economical instrument known as a 'satellite finder'. While you still have to do the work, the 'finder' indicates on a signal strength meter scale when you are steering your dish in the right direction, so you don't have watch your TV two stories below and tune frequencies while manoeuvring the dish at the same time.

The finder unit connects into the feedline between the LNB output and the tuner input, and registers the collective strengths of all appropriate band satellite transponders — and this is usually quite a visible reading.

Having found some signal, all you need to do is manipulate the antenna and feed for the highest reading and bingo... you should be able to tune the band for individual programs.

For most novices viewing the programs available will offer the key to figure out what satellite they have latched onto... but who cares??

Installing equipment

You may need to make up a few connecting cables to string the component parts of the system together. Again, your equipment supplier will usually be happy to help you out with the problem. Installation of most modules is simple, and most instruction books give detailed diagrams of the setup. The toughest job will be setting up the antenna dish.

Most antennas provide all the mechanicals to mount the dish, including the mounting pole or frame and the nuts and bolts hardware to secure all parts in place. If you have opted for one of the larger dishes — around two metres diameter or bigger — you may need to pour a concrete block to assure mounting stability. In this case it is probably better to have the job done professionally unless you have had some experience in this area. It is important that the mounting pole be installed as vertical as possible or other alignment problems will be a plague especially if your antenna has a polar mount.

System limitations

A domestic TVRO station is going to be limited in its capabilities by a whole range of factors, including antenna size, satellite 'foot prints', transponder power levels, operating frequency bands, transmission standard and encryption techniques used by the transmitting uplink broadcasters.

For the beginner this probably all sounds like gobbledygook, but the learning curve is quite brief for most users and they soon grasp the intricacies and limiting factors of the pursuit.

There are a lot of free-to-air 'fortuitous' TVRO signals available and, although at times it will be frustrating to see one of your favorite transponders has just been 'encrypted', you will learn to accept this as 'par for the course' and then go right off and find something even better.

Because programming on the satellites is changing all the time, there are usually regular discoveries to be made, especially if your system allows you to use both bands. So, the more you spend the greater your scope.

But if you have been messing with electronics and radio communications for some time... well, you already knew that anyway.

While it is nice to believe in dozens of benevolent broadcasters out there in the world who put up hundreds of millions of dollars to launch these birds for all of us freeloaders to be entertained with first-run television programming, the reality is a bit more sobering. In most cases, commerce is to make money, and these people expect *big* monetary returns for their outlay.

On the other hand, there are still heaps of free-to-air signals available for the hobby viewer, and these are getting more appealing all the time. Having established your TVRO station, this is a good foundation for the future when you may be able to subscribe to a favorite broadcaster by just hiring a decrypter instead of hiring the whole installation.

We'll discuss the world of satellite TVRO again soon.

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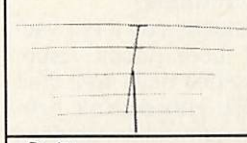

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SO YOU WANT TO BE AN AMATEUR

THE PATH TO AMATEUR RADIO

Paul Butler, VK3DBP, continues his Novice Notes series

This month in Novice Notes, we are going back in time, to the days of the thermionic valve, otherwise known as the vacuum tube. Why do we need to know about electronic devices which are out-dated and unused, do I hear you ask?

Well, the thermionic valve is neither out-dated nor unused — it is very much alive and well, and most probably living in an amplifier near you. In fact, many amplifier purists believe that the sound produced by a valve amplifier in a high-fidelity sound system is superior in every way to that produced by transistors.

The valve is still commonly used, too, in the final stages of amateur radio, broadcast and other transmitters. Its ability to handle large amounts of radio-frequency (RF) power over a wide range of frequencies means that it is the preferred way to go for many such applications.

The history and science of the thermionic valve is fascinating, too. You can almost *see* a valve working, especially when comparing the real thing with a simple diagram or two (see below).

Try fathoming what's going on inside a transistor by looking at it! (The technique does work if smoke is coming out of it, though.) Anyway, an understanding of the workings of a valve translates very nicely into semiconductor theory.

So, off we go for this edition of Novice Notes, with a close look at the thermionic valve or vacuum tube...

Valves or tubes?

Firstly, the Americans call them vacuum tubes or just *tubes* (toobs, I suppose!), which describes quite well their shape. The **ARRL Handbook** predictably follows this convention, as does (less predictably) the Australian Novice Amateur Operator's Certificate of Proficiency (**NAOCP**) syllabus.

The British prefer to call them thermionic valves, or just *valves*, a name which refers more to their function than their shape. This convention has been adopted in the Novice study guides and related material put together by the NSW branch of the Wireless Institute of Australia (**WIA**).

We're going to stick to using the term 'valve' here, partly because that is what many Australians call them, and partly because that's what *I* call them. So there.

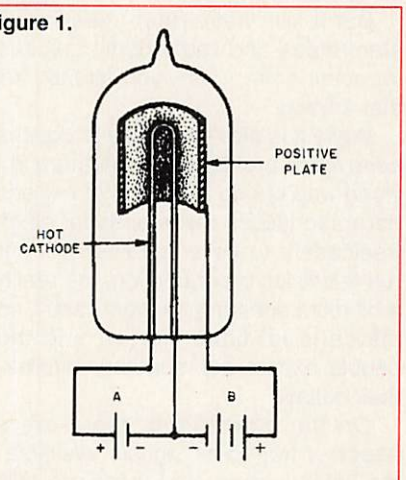
The best way into understanding how the valve works is to have a close look at **Figure 1**. This shows, in simplified form, the structure of the simplest type of thermionic valve.

Essentially, it consists of two or more metal electrodes inside a glass bottle (hence the common nick-name 'bottle'). The electrodes are connected electrically to the outside world and air has been removed from inside the bottle.

This point is an important one — the space inside a so-called vacuum tube is *not* a vacuum in the sense that there is no air (or other gas) inside.

The glass tube is *partially* evacuated, so that any gas remaining inside is at a low pressure. In fact, an inert gas is often introduced into the glass bottle, and this helps to determine the electrical characteristics of the valve. Sometimes the term 'soft vacuum' is used to distinguish this situation from a 'hard vacuum', such as in outer space.

Figure 1.



And even in space there are atoms and molecules! Enough; let's move on.

Controlling the space charge

One electrode is heated, either *directly*, by passing an electric current through it, or *indirectly*, by placing it close to but not touching a heater, which is itself heated electrically. Electrons inside the metal of a heated electrode and near the surface can gain enough energy from the heat to leave the metal and appear in the space surrounding it as a cloud of charged particles. This is often referred to as the **space charge**.

This cloud of electrons around the cathode has the effect of sending further electrons which try to leave the metal back into the cathode surface. This is important since, as we will see below, control of the space charge means control of the current passing through the device.

The ease with which electrons leave a metal surface depends on the nature of the material on its surface. The cathode may be coated with thoriated tungsten, for example. This is the metal tungsten, used for filaments in electric light bulbs, to which has been added the element thorium.

This surface, and the even more efficient rare-earth oxide coating sometimes used, emit electrons readily at low temperatures.

The use of oxide coating is restricted to low-voltage applications, but the thorium-tungsten combination works well at high voltages.

The diode has two electrodes

The heated electrode — the **cathode** — is made electrically negative by connecting it to the negative terminal of a battery or power supply.

A second electrode — the **anode** or **plate** — is a metal plate (hence the name used by our American friends) arranged like a cylinder around the cathode and connected to the positive side of the battery or supply. A valve like this with two electrodes is called a **diode** (DI, meaning two).

Referring back to **Figure 1**, we can see that in this case, the cathode in this example is directly heated by Battery **A**. The voltage or potential difference between the cathode and the anode (plate) is maintained by Battery **B**.

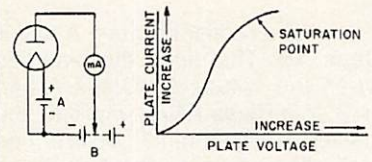
Electrons in the space charge near the cathode find themselves repelled by the negative cathode (because they are negatively charged) and attracted to the positive anode (plate).

They will move across the space, therefore, producing an electric current through the device.

If the voltage difference between the two electrodes is high enough, ALL the electrons will migrate across the gap, giving rise to a **saturation current** (see **Figure 2**).

Notice that the electric current, often referred to as the plate current, does not need a conductor such as a metal to pass along.

Figure 2.



This is an example of conduction in a vacuum; lightning is another. This emphasises the fact that an electric current is nothing more than a movement of electric charge. Electric currents usually flow in a metal wire, but not always...

Note that the diode is not a symmetrical device.

The cathode and anode can *not* be interchanged, so current is unable to flow in the opposite direction through the diode.

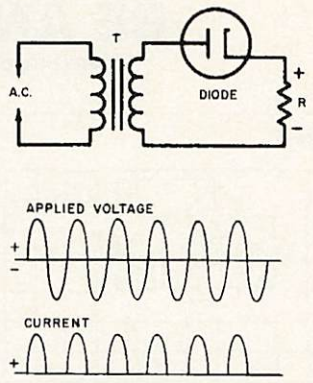
The diode is a *one-way valve*. This gives rise to the diode's characteristic behavior, the **rectification** of an alternating signal.

If a voltage is applied to the diode such that it swings alternately between positive and negative half-cycles (see **Figure 3**), an output current will be obtained only for positive half-cycles. For the rest of the time, the diode cannot conduct.

The alternating waveform may appear as the alternating current (AC) input in a power supply. The somewhat 'lumpy' output must then be smoothed by a filter to produce a constant direct current (DC) voltage.

Another application of the diode is as the detector in a simple amplitude modulation (AM) radio receiver.

Figure 3.



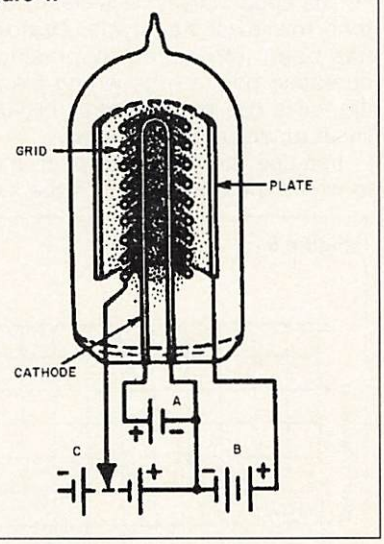
The triode has three electrodes

The addition of a third electrode between the other two (see **Figure 4**) allows for the current passing through the device to be *controlled* from outside. To let the electrons through, the third electrode is built in the form of a mesh or **grid** of wires around the cathode but inside the surrounding anode. This electrode is called the **control grid**.

Because the device now has three electrodes, it is known as a **triode** (TRI, meaning three). It is possible to add even more electrodes, creating respectively a **tetrode** (four electrodes), a **pentode** (five electrodes) and others.

If the grid is positive compared with the cathode, it will tend to neutralise the effect of the space charge around the cathode, which has been preventing further electrons from leaving the surface. This means that more electrons will now be able to leave the cathode surface and flow from cathode to anode, thus increasing the current in the device.

Figure 4.



If, instead, the grid is made more negative than the cathode, its effect will add to that of the space charge. Fewer electrons will leave the cathode and the current through the triode will be reduced. The electrons pass through the grid on the way to the anode (plate) and so the current in the grid circuit is very small and can often be ignored.

The **control grid**, then, makes the triode act as a valve (hence its name!) which controls the current passing through. It turns out that a small change in negative grid voltage has a correspondingly large effect on anode (plate) current. This leads to the idea of **amplification**, whereby a small change at one point in a circuit (the input) produces a much larger change at another point (the output).

The valve itself does not generate the output power, however; it merely controls how *much* power is taken from the power supply by the load connected in the anode circuit. The **gain** of a single stage amplifier formed by a triode valve depends on the characteristic of the valve itself and on the value chosen for the anode load resistance.

The importance of bias

It is clearly important to set the no-signal voltage of the control grid to the optimum value.

An alternating signal, with positive and negative half-cycles, appearing at the grid should not be allowed to make the grid positive with respect to the cathode. If such a condition arises, the grid circuit starts to take power and the end result is usually distortion of the shape of the input signal during amplification.

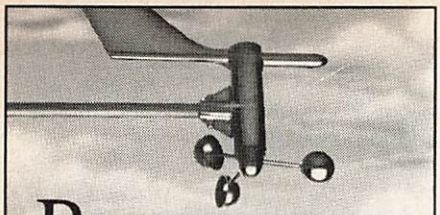
It is crucial, therefore to **bias** the grid, that is, set its DC conditions (in the absence of a AC signal) so that when a normal signal does arrive, the correct conditions still apply. It is possible, of course, even under correct bias conditions, to send in too large a signal to the grid; this will ultimately lead to distortion but not because the bias conditions were wrong.

Class distinctions

Take a look at **Figure 5**. It shows in a graph the relationship between the grid voltage and the plate current. As the first increases, so does the second, but not always in a **linear** way. Some parts of the graph are curved, others are straight.

A small signal voltage is shown below the grid voltage axis. As the grid

....☞



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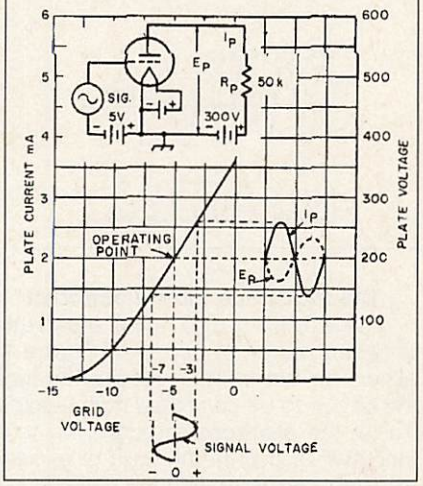
SO YOU WANT TO BE AN AMATEUR

(continued from previous page...)

Figure 5.



voltage swings back and forth each side of the *operating point*, the plate current varies as shown.

Notice that, as the operating point is on the straight (linear) section of graph, a tidy symmetrical waveform on the input produces a tidy, symmetrical waveform at the output. This is **Class A** operation.

Compare this with **Figure 6**. Now the operating point is on the curved section of graph and the output waveform is no longer symmetrical.

The upper half-cycle is clearly bigger than the lower half-cycle. **Distortion** has been introduced by placing the operating point in the wrong place, ie the valve has been wrongly biased for linear (undistorted) operation.

Imagine the operating point moved to where the graph reaches the axis in **Figure 6**, known as the **cut-off** point. Now for half the time the valve will operate normally, but for the rest of the time it will not operate at all (ie it will be cut off).

This apparently extraordinary arrangement is known as **Class B** operation.

To make a Class B amplifier work, we need *two* valves, connected in **push-pull**, as shown in **Figure 7**. Each valve is on for half the time, completing the full output waveform between them. The advantage of this arrangement is that it is much more efficient (less power lost) and its total power handling is many times greater than the valves operating on their own in Class A mode.

A class of amplifier between A and B is **Class AB**. This time, the bias lies between the values for Class A and Class B. In a **Class AB$_{(1)}$** amplifier, the grid never becomes more positive than the cathode and so no input power is needed. In a **Class AB$_{(2)}$** amplifier, has a grid current for part of the cycle and so requires a small amount of input power. It can deliver more power than the Class AB$_{(1)}$ amplifier.

In some situations, non-linearity and the introduction of distortion is not important. The efficiency of the amplifier can then be improved still further by using **Class C** bias.

This time, the bias is *beyond* the cut-off point, such that the valve only conducts on the peaks of the input waveform. The output is a very distorted version of the input but filters can then be used to clean it up a little.

Figure 6.

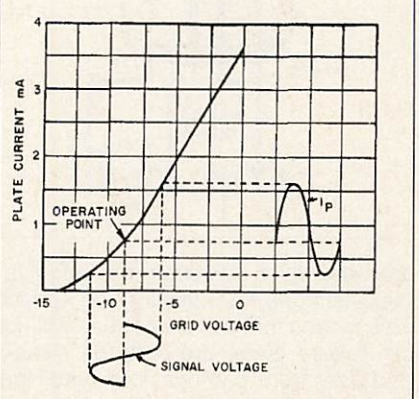
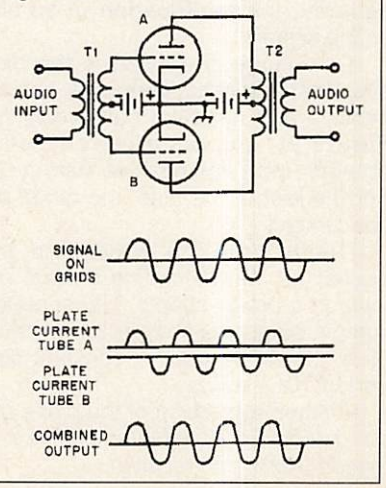


Figure 7.



Now for a few questions...

1. How many grids are there in a triode vacuum-tube?
(a) 1
(b) 2
(c) 3
(d) none

2. The main elements in a triode vacuum-tube are:
(a) suppressor, control grid and cathode
(b) cathode, control grid and screen grid
(c) anode, control grid and cathode
(d) anode, heater and cathode

3. In a triode vacuum tube, the grid:
(a) increases inter-electrode capacitance
(b) heats the cathode
(c) controls anode current
(d) emits electrons

4. To convert alternating current to direct current, use is made of a:
(a) thermistor
(b) resonant circuit
(c) diode
(d) carbon resistor

5. Class A operation is characterised by:
(a) low gain, low distortion, high efficiency
(b) high gain, low distortion, low efficiency
(c) high gain, high distortion, high efficiency
(d) low gain, high distortion, low efficiency

6. An audio amplifier operating in 'Class A' is:
(a) highly efficient
(b) likely to cause severe distortion
(c) a linear amplifier
(d) biased close to its cut-off point

7. An amplifier stage operating under 'Class B' conditions is biased to:
(a) near cut-off
(b) three times cut-off
(c) twice cut-off
(d) half cut-off

8. A feature of 'Class C' amplification is:
(a) linear operation
(b) non-linear operation
(c) low efficiency
(d) low distortion

9. The highest power efficiency in a radio frequency (RF) power amplifier is obtained when it is operated in:
(a) Class B
(b) Class A
(c) Class C
(d) Class AB

10. An amplifier stage operating under 'Class C' conditions is biased:
(a) to cut-off
(b) beyond cut-off
(c) between cut-off and saturation
(d) to permit linear operation

Answers
1(a), 2(c), 3(c), 4(c), 5(b), 6(c), 7(a), 8(b), 9(c), 10(b).

Next time, we'll look again at the valve and see some other types and applications.

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DX Logbook

By Rob Williams

Welcome once again to CBA's shortwave column, which is designed for shortwave DXers who need the latest news and happenings from around the bands. If it's happening on the bands we try to cover it.

This month we bring you plenty of news from Europe, book reviews, as well as news of a new DX program. As always, all frequencies are in kiloHertz (kHz), and all times are in UTC (same as GMT or 'z') unless mentioned otherwise.

VOA Bethany finally signs off

It seems that the **Voice of America** can't even get its act together when deciding when to close down a major broadcasting site! As I reported in my last column, the scheduled date for the close of this once-important broadcasting site *was* January 4. Well, that soon changed, after the deadline for the column was reached, to November 14.

John Vodenik had been keeping DXers informed of developments, and learned only a few days beforehand of the changed date for the closure. Those who sent their final reception reports in should have received their QSL cards by now, marking the end of another chapter in the history of VOA.

Like many broadcast stations in populated towns and cities, as the population density expands what were once isolated and remote broadcasting sites end up being surrounded by suburban dwellings. Bethany is another good example of this. Over the years there had been more and more reports of TVI and RF radiation problems coming from the site as the population moved closer, and John feels that VOA management used this as one excuse to close the station. John expects another shopping center to rise where VOA Bethany once was. Will they call it VOA Shopping town...?

Internet update

To keep you informed of what is available on the *information autobahn* here is some more news I found while cruising the Internet.

• **Deutsche Welle** has joined in and now provides a worldwide web (WWW) site for its TV and radio programs. The site's address is **WWW-dw.gmd.de**.

• **Radio Prague** can be contacted at the following address: **cr@radio.anet.cz**.

• **Radio Austria International** is contactable at **kwp@rai.ping.at**.

• Meanwhile, over the other side of the world a very comprehensive www site has been set up in Canada by the **CBC**, which runs **Radio Canada International**. Its site address is **http://radioworks.cbc.ca/radio/services/faxtrack.html** (really!).

Finnish shortwave programs

Finland has English at the following times and frequencies until the end of March:

0530 to 0600 to Europe and Africa and the Middle East on 6120, 9635 and 11,755.

0745 to 0800 to Europe on 6120, 9560 and 11,755.

0800 to 0930 to Australia and Asia on 15,330 and 17,800 (USB).

1230 to 1300, **1330 to 1400** and **1430 to 1500** to America on 11,735, 15,400 and 17,740 (USB).

1930 to 2000 to Europe on 6120, 9730 and 11,755.

2330 to 0000 to Asia and America on 5990, 6105 and 9680.

The last seven minutes of all English transmissions on Sundays are in Latin.

Israel gets a reprieve — of sorts

The e-mail networks have been running hot over the last few months with reports to the effect that the **Israel Broadcasting Authority** was planning to end all shortwave transmissions on January 1 this year. Due to budget restraints, it looked like transmissions were in jeopardy, however as the budget was released, funds were somehow found to keep the station afloat for at least another year. I've heard of this tactic before, where a government makes a decision to cut funding to its broadcasting services and the authority in charge of broadcasting starts to make threats about having to cut shortwave services due to budget cuts. The government realises that it needs an international voice so it decides to provide just enough funding for the shortwave broadcasts to continue. This way, the status quo is maintained. A late news item from Israel as I write the column is that **Kol Israel** ceased the English broadcasts at 1400 and 2230 effective January 8.

English output from Prague

Radio Prague has English transmissions as follows:

0700 to 0730 on 5930, 7345 and 9505 to Europe.

0730 to 0757 on 17,485 to South East Asia and East Africa and on 21,705 to Asia and the Pacific Rim.

1130 to 1157 on 7345, 9505 and 11,990 to Europe.

1700 to 1727 on 5930 and 7345 to Europe and on 9420 to the Middle East and South Asia.

1800 to 1827 on 5930 and 7345 to Europe and on 9420 to the Middle East and Asia.

2100 to 2127 on 5930, 7345 and on 9420 to Australia and the Pacific Rim.

2200 to 2227 on 5930 to Europe, 7345 to North America and on 9420 to West Africa.

0330 to 0357 on 5930 to the Middle East and South Asia.

0330 to 0357 on 5930 to the Middle East and South Asia and on 7345 and 9440 to the Middle East and East Africa.

...More European news

Radio Exterior Espana from Madrid is using English to Europe at **2100 to 2200** on 6125. To North America between **0000 and 0200** and **0500 to 0600** on 9540. Its **0500** broadcast is directed to Australia and makes easy reception of this station. Its output to Africa is aired between **1900 and 2000** on 9675.

...And shortwave output from Portugal

Radio Portugal, transmitting from Lisbon, can be heard in English between 2000 and 2030, then 2030 to 2100 in French on 9780, 9815, 11,970 and 15,515.

Communist news from Europe

The **Benelux DX Club** has reported that **Radio Tirana**, from Albania, is broadcasting in English as follows:

0130 to 0145 and **0230 to 0300** on 9580 and 11,840 to America.

1700 to 1715 on 7155 and 9760 and **1900 to 1930** on 7230 and 9730 to Europe.

The club notes a variation in Tirana's frequency by up to 5kHz on the above channels.

Turkish news

The **Voice Of Turkey** from Ankara is using the following schedule for its English output until March 26:

0400 to 0500 to America on 9445.
1330 to 1400 to Asia on 9675.
2100 to 2200 to Europe on 9400.
2300 to 0000 to Europe, the Middle East and America on 7185, 9445 and 11.710.

CIS news

Radio Ukraine International is using its winter sked with English to Europe as follows:

0100-0200 (also to America) on 6055, 7180, 9620, 9810 and 11,870.
0400-0500 (also to America) on 6055, 7180, 9810 and 11,870.
2200-2300 on 4820, 5940, 6020, 7180, 7240 and 11,870 kHz in German.
0000-0100 on 4820, 5915, 6020, 7135, 7180, 7240, 7405, 9620 and 11,870.
1800-1900 on 5940, 6130, 7280, 9640, 11,840, 12,030 and 13,720.
2100-2200 on 4820, 5940, 6020, 6130, 7180, 7240, 7290, 7405, 9810 and 13,720.

And, while were in the CIS, **Radio Vilnius** is using English as follows.

0000-0005 (Tue-Sat) and **0000-0030** (Sun/Mon) to America on 7150 (via Russia). **2000-2030** and **2230-2300** to Europe on 1557 and 9710.

Thanks to the *Benelux DX Club* for this valuable news item.

Radio Belarus (**Radio Minsk**) has English at **1945-2000** Tuesdays on 5940, 7105 and 7210.

Thanks to *Radio World* for this note.

Radio Intercontinental has English from **0700 to 0705** on 15,400 according to a report on *Media Network*.

WWCR news

Andy Sennitt has posted the latest sked for **WWCR**:

Transmitter no 1
1100-0000 on 15,685.
0000-0700 on 7435.
Transmitter no 2
1400 to 0100 on 13,845.
0100 to 1400 on 5935.
Transmitter no 3
1500 to 1900 on 12,160.
1900 to 2100 on 11,970.
2100 to 2300 on 12,160 and
2300 to 1500 on 5065.

Zimbabwe back on shortwave

Jorma Mantyla in Finland reports that the old frequency of 3396 has been reactivated by the **Zimbabwe Broadcasting Corporation**. The new station was officially launched on December 5 by the President of Zimbabwe.

The station was supplied by TCI and installed by technical staff from the Zimbabwe Broadcasting Corporation and consists of two TCI-615-2-100 log periodic Yagi antennas and two Continental 100 kW transmitters.

The site is at Guinea Fowl, near Gweru, in the center of Zimbabwe.

Australia

Radio Australia is investigating the exchange of air time on overseas transmitters with several other international broadcasters, all of which have indicated an interest in using RA's transmitters to broadcast to this part of the world.

New publications from KLNS

Two *almost* free publications for shortwave DXers are available from **KNLS**, Alaska for the paltry cost of two IRCs per book to cover postage.

Radio Propagation for Beginners and **DX Tips for Beginners** are both professionally-produced and contain a wealth of information. Both books have been written by **Carl Mann**, a DXer of over 30 years experience.

Radio Propagation for Beginners is 15 pages thick in A5 format, and gives a general run-down on how shortwave propagation works. Simple yet informative diagrams intermixed with the text makes for easy reading and understanding. If you are fascinated about how shortwave signals travel around the world and want a starting point from which to build up a good understanding on the topic, then get a hold of this book.

For those who are starting out in the hobby and are looking for a cheap, easy-to-read book which contains a wealth of good advice, then KNLS' other publication, DX Tips for Beginners, is for you. It has easy-to-read chapters on topics such as the receiver, creating a log book, antenna tips, propagation, writing reception reports and QSL card collecting.

The address to write to for a copy of either or both books is KNLS, Anchor Point, Alaska USA.

It's good to see that some stations go out of their way to try to help people get started. I wish more stations would do it...

Transmitter document project results released

A 10-year research project by Belgian DXer **Ludo Maes** has finally been completed. Called the **Transmitter Documentation Project**, it features details on shortwave transmitters around the world. The project involved help from international organisations, publications, DX clubs, transmitter manufacturers and radio stations.

Arranged in country order, the list includes the name of the station, transmitter site, geographical co-ordinates, number of transmitters at the site, their power, brand and model of transmitter, and the year they were installed. The 52-page book also includes a breakdown of the number of shortwave transmitters in use, grouped by transmitter power, country and manufacturer as well as a list of shortwave manufacturers.

TDP SW-94 is available for US$6.00, which includes postage, from Ludo Maes, PO Box 1, 2310 Rijkevorsel, Belgium. The telephone number for the *really* keen (from Australia) is 0011 32 3 314 7800.

DX news from DX publications
OZ DX news

• David Foster reports hearing **All-India Radio**, Delhi, in English on 3295 between 1733 and 1741.

• Harare was heard on 4828 at 2007 with an ID in English as **Radio 3**.

• 11,870 kHz: **FEBA** was heard on this channel at 1630 with news in English followed by religious programming.

And that ends another column. If you have any DX news or want to share your latest QSL catch with other DXers, then drop me a letter.

My address is PO Box 108, Minto, NSW 2566. If you have a question and want a personal answer then please include a business-size SSAE.

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Backscatter... By Jack Haden

First I must apologise, as most of this news should have appeared in the last issue of CBA, but due to space limitations it had to be held back. So here we go at last...

Sierra Alfa DX Group

The Australian division of the Italian-based Sierra Alfa DX Group held their third general meeting on the evening of December 10 in Melbourne with over 70 guests attending.

The guest of honor was, of course, the group's founder, Antonio the 1-SA-001, who came all the way from Italy for the event. Plenty of good food and great entertainment ensured a lively atmosphere as members mingled with each other, some meeting face to face for the first time.

Awards were presented by Antonio, with a special one going out to a couple celebrating their 63rd wedding anniversary. Australian co-ordinator Pino, the 43-SA-01, announced a number of special events for members to participate in, including a special raffle with first prize a round trip to Italy which will be drawn at the 1996 AGM by Antonio the 1-SA-001.

It was also announced that an amendment to the rules now means that prospective members must have a minimum of 15 DXCC countries confirmed by valid QSL card before the application will be considered. Fees remain unchanged at $20 for Australian stations or US$15 for outside of Australia and its territories.

The membership package includes a club callsign, member's callbook, complimentary QSL card samples and entry into all Sierra Alfa-sponsored radio contests. A financial member's partner may also join for the modest fee of $5 with full entitlements, and unlike some radio groups there is no waiting list to join Sierra Alfa. In 1994 there were approximately 1,500 members worldwide with about 100 of those in Australia.

Enquires may be directed to: Pino, 43-SA-01, PO Box 466, Brunswick, Vic 3056, or in NSW write to: Bill, 43-SA-191, PO Box 88, Boorowa NSW 2586.

Alfa Tango DX Group

It seems all the major DX clubs were having their annual get-togethers in the final months leading up to Christmas and the Italian-based Alfa Tango's Australian members were no exception.

Also held in Melbourne, the annual general meeting was hailed as a great success, with numerous awards and plaques presented to the deserving, with the job of Master of Ceremonies going out to popular Melbourne DXer, Dave the 43-AT-109. The night was far from boring, I'm told!

The quality of the venue was praised by all, and thanks went out to Ray, the 43-AT-042, the Awards Manager, who was credited with an excellent job well done administering the entire awards program.

One must remember people like Ray do not get paid for their hard work, as all efforts put into the club are voluntary with the only reward being satisfaction at a job well done. Praise also went out to another important cog in the Alfa Tango wheel — Nick, the 43-AT-012 the Australian co-ordinator, who has done a more than excellent job making sure things run smoothly and that the club publication for members, **11 News**, comes out informative and on time amongst many other behind-the-scenes duties.

The Australian membership of Alfa Tango now totals around 190 and, as with all DX clubs, some people are declining to renew membership due to the dramatic decline in DX conditions in the past year, and thus tend to lose enthusiasm with the radio DX hobby. Then again, 190 is not a bad figure for a country the size of Australia and the steadily shrinking out-of-band radio population attributed to poor propagation on 11 metres.

Improvements to the Australian division have been very noticeable over the past two or so years, as both committee and ordinary members alike cast aside bad memories of a few years back, which damaged the group's reputation.

The continued success of the Australian version of 11 News is a credit to the group, Packet information, antenna designs, protocol procedures and more. Despite being a quarterly publication, it is well sought-after by the membership, especially the special interest articles on radio-related computer information which has generated quite a lot of interest... and good luck for 1995!

The **Tweed Radio DX Group** also held a relatively large shin-dig in Murwillumbah, with more than 200 CB radio fanatics making the now-annual pilgrimage. President of the Tweed Radio DX Group, Bryan, 43-TR-01 and Jenny the 43-TR-184 from Kalbar in Queensland, presented the Mayor of Tweed, Mr Max Boyd, a special plaque at the opening ceremony.

Local hotels in the district were booked out, although the CB invasion wasn't entirely to blame, as the regional Lions Club convention saw an additional 400 people come to town. I bet the publicans in Murwillumbah were rubbing their hands with glee! Some visiting Tweed Radio members were billeted at local members' houses.

With space stretched to the limit, many had to sleep on the floor.

Quite a number of interstate number plates could be seen around town, with vehicles bristling with antennæ. Some Tweed Radio members came from as far away as the Untied Kingdom, whilst others made it from Darwin, the Atherton Tablelands, Adelaide and other southern states.

As with all radio gatherings, it proved an excellent opportunity to finally put faces with the voices heard on the radio, whilst others renewed old acquaintances over a cold ale or two. The major raffle was drawn with Steve, 43-TR-334 from Dee Why in Sydney winning the Uniden PRO-640E transceiver.

A hand-held power microphone as second prize was won by a visitor named Gordon from Mooball in NSW, and the third prize, a set of headphones, was drawn in favor of Bill the 43-TR-326, also from Dee Why in Sydney.

All of the mentioned prizes were kindly donated by courtesy of Brian, the 43-TR-323 of B & S Communications from North Frankston in Melbourne.

Amateur radio was also at the Tweed Radio convention, with the president of the Tweed Valley Amateur Radio Club, Stewart Marshall proudly displaying his amateur radio station to show the difference and variety that amateur radio has to offer the budding radio enthusiast.

Highlighting the differences between the two hobbies, Stewart cited Australian amateurs contacting the US Space Shuttle and the Russian MIR space crews as perfect examples of the diversity.

The **Launceston Tasmania CB Radio Club**, better known to most of us as the **Lima Tango Club**, formed back in early 1977, is still going strong, and from strength to strength. A letter from Shirley Hamilton, honorary secretary, informs me that not all of the old CB radio clubs have like DX, faded away.

As most old timers on 11 metres will no doubt remember, the Lima Tango club was part and parcel of the active fight for legalisation of CB radio and organising several meetings with other clubs and attending meetings throughout Tasmania.

Lima Tango, amongst others, drew up and lodged to the appropriate authorities in Canberra documents encouraging the legalisation of CB on 27MHz, and finally on July 1, 1977, CB radio became legal in Australia.

The club today is still very much active and holds many social functions for members and friends throughout the year, and any profits made are utilised as subsidies for club dinners, a Christmas party, and prizes for the fishing competitions and other social events.

The club over the years has helped many appeals, such as the bushfire and flood appeals, the Year of the Disabled and MS.

Primarily the club caters to the 40-channel community, both on HF and UHF.

Should you be interested in further details, please contact Shirley Hamilton at Lima Tango CB Radio Club, PO Box 626, Launceston, Tas 7250.

News from the DX Clubs

DXinternational

By Jack Haden

Welcome to the first DXI for 1995, and I trust that everyone had a safe and enjoyable festive season, both family and DX-wise. What's in store for DXers in this brand new year, many have asked? Well, you tell me and we will *both* know, as the 11 metre band propagation has been in a world of topsy-turfy — there one day gone the next, strong signals one day, weak the next, and so the story goes on.

This summer's long-haul DX is a wee bit of a fizzer, with smatterings of Europe and the Middle East with a touch of Africa, but it's kept some people's interest in the hobby alive.

Even DXers in our northern states, long considered prime DX spots, are reporting lean times too. However, this has become a blessing to some as the absence of the regular five by nine plus signals from Europe means we can hear some of the less powerful signals from semi-rare DX countries from the continent. A good five or six-element beam and a good ear (plus patience) should give dividends in the long term.

Local DX...

Trans-Tasman and interstate DX have kept things interesting for most of us. Some of the signals from New Zealand have been quite good, and interstate DX has been pounding in on a regular basis, creating utter bedlam on the 40-channel 27MHz system.

After picking a station to work, it is then quite a chore to go and find a clear channel to establish a conversation without being wiped out by someone else, either local or interstate. Then again, maybe from overseas too if conditions are right.

Some choice DX has been noted from our very own region too — in past weeks I have heard signals from Norfolk Island, Lord Howe Island, Thursday Island, Christmas Island, Cocos-Keeling Island, Kangaroo Island, and King Island, the majority of which are good for some IOTA points. All of those islands mentioned were heard on either channel 16 or 35 SSB amongst the chatter of regular interstate activity.

Slim No 1

There have been a few slims about too. Some bright spark on the east coast has been pulling the proverbial leg, so to speak, as he stirs people up by signing as **193-AT** and **217-AT** — and his latest in early January was **270-AT**, complete with fake Japanese accent.

He has been heard using a variety of suffixes, and not surprisingly some Alfa Tango members are a wee bit vexed at him for using their prefix for his fun and games. Our friend quickly disappeared when I attempted to speak with him in Japanese on January 8, as he was busy drumming up business by signing **270-AT-102** at the time... *Nihongo wa wakarimasen desu ka?*

Slim No 2

Just be a tad cautious when dealing with the **274-PI-01** operated by 'Ted', who is claiming to be on Pitcairn Island but I, along with a few others, have our doubts.

When I queried Ted about two very good amateur radio friends of mine who live on Pitcairn he abruptly wound the contact up, telling me he was having trouble hearing me due to fading. Judging by the accent and beam heading I am willing to put my money on Ted being a wee bit closer to Australia — say New Zealand, for starters, rather than Pitcairn Island.

Nice try, Ted.

Slim No 3

More hanky panky. This time South Korea falls victim by way of a **2-AT-177 / 100** who appeared on the band willing to work all and sundry in early December. Quite a number of DXers, especially Alfa Tango members, were immediately suspicious of this one due to a number of information irregularities that just didn't add up.

The QSL route was once given as **2-AT-308**, but cards addressed to that person have been returned to senders with no knowledge of the event... Those who did smell a rat at the time held back on QSLing to wait to see what happened were not surprised that their suspicions proved to be valid.

Slim No 4

A mate in Melbourne who is a very experienced DXer reports a chap doing the rounds in December telling people he is a member of an Antarctic Research Team. Some bought his story, but the day afterwards the same voice was heard now aeronautical mobile off Western Australia en route to Wyndham in a Beechcraft plane!

He was signing as the **Foxtrot Zero Two Zero Victor** and had parked himself rather comfortably on the DX call frequency to entertain for a while. Maybe a coincidence that the voices sounded *very* identical along with the operating mannerisms. Could this person also be the **229-AG-102**, Bill, who was reported about in mid-November with a similar story line about Antarctica? Work first, worry later.

Palestine... DXCC status?

By the time you read this, Palestine will most likely be added to the DXCC listings on amateur radio, as there has been much activity from there using the **ZC6** prefix. So it is only a matter of time before the news of confirmation filters through to 11 metres.

Some of us have already worked Palestine in the form of Sami who was active for a time as the **PNZ-01** from Jericho. Haven't heard him about for quite a time now, but I did receive a picture postcard from Sami confirming a contact made last year.

Should DXCC status become a reality, which I am near certain it will, we should expect quite a bit of DX activity from there, both by locals and visiting DXpeditioners.

Chechnya... a new one?

This break-away former Soviet Republic was poised to become a new DXCC country, but after Russian President Boris Yeltsin decided to send in the troops things now remain unclear as to what is happening.

Chechnya, or Chechnya as some spell it, has been around 11 metres for some time, with most operators still signing with the **50** prefix, although rumor of change has been about for the past 12 months or so. As a result, no real effort has been made radio-wise for separate DXCC status and thus entitlement to its own prefix. Wait and see, but if you have the chance, work first and worry later.

A station appeared in January signing as the **338-CR-02** operating from Chechnya, however I still don't think this one counts as a new one yet, just wait and see. Best work first then worry later, as I keep saying. In fact, work *everything*, then worry!

Hong Kong, Macau and Taiwan

With 1997 just down the road a wee bit, we have to keep in mind that Hong Kong will most likely be deleted from the countries list when the People's Republic of China takes over from the British. Likewise, in 1999 the Portuguese colony of Macau, a hydrofoil ride from Hong Kong, will also go back to China and go the same way DXCC-wise.

Last but not least is the big issue over Taiwan. Beijing has already made it abundantly clear that it will not grant Taiwan full independence in 1995, and will press hard for its eventual return to mainland rule. However, under DXCC rulings Taiwan will, I am sure, remain a separate DXCC country from that of mainland China.

Rotuma DXpedition cancelled

It was most disappointing to the DX community to hear that the planned DXpedition to **Rotuma** (325) was terminated due to financial problems and in securing reliable transport from Fiji to Rotuma, always a difficult task even in quiet periods. Also, periods of poor

propagation paths throughout December damaged the two operators' enthusiasm somewhat.

The small plane which goes to Rotuma is always heavily booked, and the shipping service not all that reliable. There's not much point in flying all the way to Rotuma if you cannot ship your generator fuel to the island in advance ready for your arrival.

The cancellation of the DXpedition to 325 land brings home to all DXers the hard work and mounting hidden costs that go into every DXpedition to secluded islands, not only in our Pacific but anywhere in the world, be it in the Atlantic or elsewhere.

Unlike our amateur radio brothers, finding corporate sponsorship is near impossible, and securing donations from 11 metre band DXers to help meet costs is just as hard. So you will find that the majority of DXpeditions on 11 metres are nearly always funded by the operators themselves out of sheer love for the hobby and the art of DXing. Keep that in mind next time you work another DXpedition and decide whether or not to send an American dollar for return postage!

What's in a callsign?

Heard a prominent Alfa Tango member rake another member over the coals for saying **43-America Texas** instead of **43-Alfa Tango** when identifying on air the other day. Bastardisation of the phonetic alphabet on radio, *especially* on 11 metres, has always added spice to the hobby.

I can understand the member's action in trying to install a sense of credibility and dignity into the club of which he is a member, and it's a pity more 11 metre operators wouldn't adopt the positive attitude he has to the hobby. However, this action raises the issue of just who in fact 'owns' a callsign, and who can dictate to others on how it is used, especially when it comes to illegal operations.

The only harsh thing that could happen would be expulsion from the group and not much more than that — that is *if* you belong to the group in the first place?

The Italians are the worst offenders in saying America Texas instead of Alfa Tango when making calls followed by some other European countries. Being a member of a club one should take pride in the group and thus conduct oneself on air correctly using the allocated club call in a correct and proper manner and thus reflecting the good name of the club.

Then again, not all people with 'AT' calls are necessarily Alfa Tango members. I have heard the odd **A**ustralian **T**erritory club member signing with the correct phonetics — which, of course, is Alfa Tango! Some Australian members of the Italian-based Alfa Tango are not amused whilst others are merely very confused!

Central/South America and the Caribbean

Signals from South America are far from strong and reliable as they once were, although a number of DXers on the east coast of Australia are working the odd one or two, but those on the west coast are finding the going reasonably hard. However, the Caribbean is a lot easier to work with a variety of countries to choose from...

Puerto Rico is an old favorite with most of us, and it came as no great surprise to hear **11-PR-999** with Fernandez, often better known to some as 'Junior' at the helm. Fernandez was five by six, peaking seven, from his home in San Juan at 2334z and was busing working a few stations in New Zealand.

Also heard from Puerto Rico was UBX-101 at 0120z with horrible modulations problems connected with the use of a silly reverberation microphone and, although a good five by five, he didn't appear to be scoring any DX due to the fact it was very hard to understand him in the first place!

Belize was logged around the 0246z mark with a small pile-up of stations working a gentleman named Salvadore operating as 218 something-or-other. Although a five by six, he was hampered by a jammer either in Australia or New Zealand who tried to stop people from working him. Sadly, the jammer was successful in a number of cases.

The **Dominican Republic** was loud and clear with 37-CR-102 operated by Jerry peaking five by eight to nine at 0210z. However, the cricket must have been on television here as not one Australian station responded to his calls on the DX call channel.

Middle East and Arabia

Signals from this region have remained reasonable to very poor, openings have been short at times and often unpredictable making DXers work hard for a good contact. Unfortunately it is more or less a case of being there at the right time, with the antenna pointed in the right direction to reap the full benefits. As we near the end of our summer conditions will not get much better to this region, so make hay whilst the sun shines, as they say!

Palestine appeared by way of Amil who was signing as the HAZ or HEZ Number One, and at 1041z was a poor four by two report at best from Jericho. Amil also had quite a problem with his audio, due to his 12 volt battery being near flat and thus was not securing many contacts. Had a quick check for Sami, the PNZ-01 also active from Palestine, but nothing heard, although I logged him the other week working a Queensland station up very high on the band.

The **United Arab Emirates** was logged at 0922z with regular Dubai station, Nasser, the 94-AT-101 leading the way with a five by six report. Just down the band from Abu Dhabi was the ER-1000 operated by Nabil who was also a five by six report at the time.

Bahrain appeared on the band in early January by way of Roddy, a British expatriate who signed as the Unit-2 Portable. Although there were a few people wishing to work Roddy for a new one he vanished from the band rather quickly after giving a couple of stations a quick exchange of signal reports. Roddy mentioned that he was not 'equipped' for QSLing at this time, which is a pity as many still need Bahrain as a new one on 11

....☞

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DXinternational

By Jack Haden

metres.

Egypt was heard the other day as AXR-555 appeared with Denny at the mic. At the time Denny made it clear he was not interested in working the many DXers on frequency and would not give much away as to his situation in Egypt. From bits and pieces noted I managed to come to the conclusion that Denny was a Filipino working on some ship off or in Port Said which all adds up as he was working a station in the Philippines in Tagalog at the time.

Israel is about as usual, with a variety of stations populating the band, and at 1059z I heard a young lady named Beth operating as 97-MX-69 from Tel Aviv. Beth was a good clear five by five at the time and was answering a question about activity from 108-AT-017/97, of whom I haven't heard for some time now.

As usual, some reasonable signals are also present from **Kuwait**, **Lebanon**, **Saudi Arabia** and **Jordan** indicating fair propagation still exists to this part of the world.

Africa and the Indian Ocean region

DX to this part of the world has been most unreliable in recent weeks. Even when the band does open, the signals have been very poor. Should you be lucky enough to get a contact going, more often that not fade makes the going a little rough for both parties.

In past summers we used to get morning long path openings, mostly to North Africa. However, so far in 1995 this propagation appears to have vanished. Some mornings we often can't get a decent signal out of North *America* let alone North Africa! Look for Africa any time from 0300z onwards.

Ceuta and Melilla appeared on the band at the rather early hour of 1402z, by way of 106-SA-011, name unknown. Although the signal was a poor but workable four by two, a few night owl diehard DXers in Sydney and Melbourne made it through for a quick exchange of reports. For some it was a new country which made it all the more exciting and worthwhile.

Christmas Island was heard a few times in a maritime mobile capacity as 217-CT-102 with Tony at the mic, around the 1052z mark was five by six near Christmas Island. Another from this division heard was 217-AT-203 at 0906z. This four by three signal is not an Alfa Tango station but an Australian Territory club member, I seem to remember, although I may be wrong... QSL route not heard/given.

The **Canary Islands** have been most consistent out of all the Africans on 11 metres with some good signals from time to time. At 1155z I logged a five by eight signal from Gomez, the 34-SK-06 from Las Palmas. Further up the band was 34-AT-103 or 113 doing battle with some New Zealand stations which weren't audible here at the time. Later, at 1339z I noted RCI-109 operated by Raoul also from Las Palmas with a fair five by three peaking five report.

The **Maldive Islands** were heard the other day by way of UNIT-333 operated by a lady whose name I could not get. Operating from the capital, Male, the UNIT-333 was a steady five by six at 0715z and by 0723z had virtually faded away to nothing.

The **Seychelles** appeared on 11 metres at 0812z as RADIO-926 operated by Jean made numerous calls on the call frequency that strangely went unanswered despite being a good five by five in the clear. Perhaps most Australian DXers were riveted to the television screen watching the cricket at the time?

Ethiopia has been doing the rounds as 206-YY-101 but has been difficult to catch here.

Rwanda has been noted on two separate occasions with RADIO-902 operated by Paul and 227-AT/DX also making an appearance, QSL via 12-AT-180 for that operation.

Mali has been about with French station 14-AT-882 signing from the 216 division and reported to be very active on the high end of the band.

Sierra Leone (65) has also been about the traps with RR-392 operated by Jean-Michele also operating on the high end of the band.

Algeria (146) was reported also in early January via Arabic speaking FAR-01 operated by Abdhak.

Burkina Faso (170) was rumoured to be active with a European operator signing as RB-009 with other details unknown... a few of us need that one!

Rumor circulates the band that **West Sahara** and **Rio de Oro** (300) have been active from time to time, although nothing solid on it yet.

Europe

You can *really* tell that propagation is depressed when the big strong signals from the continent disappear. Usually heard on a regular basis, this season European signals are down on past years. One can tell conditions are strange when **Poland** and the **Czech Republic** are the first Europeans to come through, instead of the Italians, as Sicily and Sardinia are usually the first to make noise as expected in past summers.

Fade has become a nuisance, too, on the European path, making lengthy chit chats with old mates more difficult as signals deteriorate quickly. Look for Europe any time from 0530z onwards, and remember that patience is the key...

Wales in the United Kingdom was heard at 0910z with a reasonable five by five report coming from 163-AT-189. Further down the band 163-WR-105 operated by Taffy was a tad better at five by six peaking seven around 0914z.

Azores is a hard one for some to secure due to noise from other European stations, so I was surprised to hear a good five by six signal from 75-CX-06 operated by Al at 1156z. Also on the call frequency was 75-AT-112 or 102 trying to be heard through the rabble at 1212z.

Slovakia was about at 1233z with 330-AZ or AT-103, with a poor three by one report this station didn't get one taker to his three or four calls on the call frequency as the band was just about finished at that time.

Croatia seems to come and go on 11 metres, active one opening and none the next it appears, although I noted 327-CR-109 at 1222z working a Sydney station with a fair five by two report. Just a few days before Christmas 327-SD-0 appeared in a DXpedition capacity with the QSL route via an address in Italy.

Malta seems to becoming more popular. Once considered a rather rare country, I have heard a handful of stations in recent weeks on air. MA-102 has been heard many times with Giano at the controls, also heard a 93-SR station who drops his club number when calling around the 0950z mark.

Romania is one of the more irregular countries on 11 metres from Europe, but at 1131z I heard a Queensland station working ZZ-66 operated by Mick with a five by three report. Mick was demanding minimum three American dollars for QSLing... best give Mick the flick, I think!

Rodi Dodecanese is one still much needed by some, and I was surprised to hear 59-KY-4 operated by George call for Pacific and not get one reply on the call frequency at 0844z, however his call wasn't wasted as he was promptly snapped up by an Indonesian station. George was a fair five by three at the time but the modulation was loud.

Crete is another semi-rare one from Greece and was logged at 0900z by way of Kristos who was signing as UNIT-67. Kristos was a good five by six at the time and was talking to a station in New Zealand.

Kefalonia Island in **Greece** was there for those looking for IOTA numbers, and at 0845z the 18-SD-KI operated by Leon was a workable four by five report. QSL route not known at present.

Liechtenstein was struggling to make it through the noise at 1105z with the emergence of 40-SA or SR-101 just audible at a three by one report. Quite a bit of rabble from **Italy** and **Poland** made hearing the station most difficult.

Gibraltar is usually about the band when **Spain** and **Portugal** are coming through, and at 1020z I noted UNIT-5 operated by Gonzales with a good five by five report. Further down the band a 55-AT station was working a Thailand station although only four by one at 1026z.

Andorra is another of the semi-rare DX countries out of the continent, and at 1112z the SAFARI-94 with Knut at the mike was a reasonable four by three report. Not bad considering Knut was operating

out of a mobile home on a three-month tour of Europe from his home in Denmark. Equipment was a Belcom transceiver into a three-element beam mounted 10 feet above the van's roof with 25 watts out.

ITU **Geneva** was reported to have been active a few weeks back on 11 metres, although full details remain unclear. This is a very rare one needed by many DXers, the station signed as 235-AT-0 and QSL information is via 1-AT-039 in Italy.

Iceland is one of the harder cookies to crack out of Europe due to propagation conditions and a lack of active operators. However it was nice to hear 27-IR-04 operated by Evie the other day coming in at a poor but workable four by one peaking two at times.

San Marino has only a handful of 11 metre band stations on the high channels, and it was nice to hear 1-ML-101 signing portable 36 division the other night at 0930z. I couldn't get the operator's name but he is on vacation from Rome in Italy and was giving a Rome address as the QSL route at the time. Although a poor three by three, he managed to work a couple of Queensland stations. Haven't heard Guido, the 36-AT-102 for a while either.

Mount Athos has been reported as active with the much-welcomed appearance of 254-MA-001 noted mostly on the weekends only. Other information remains unavailable at the present but one I know many still need badly to boost stagnant DXCC tallies.

Asia and the Pacific region

One good thing about the Pacific is there is never a dull moment DX-wise. We have all these island countries out there with 11 metre band operators coming and going all the time, so you will never know what you may miss out on in our own region.

Overall the DX conditions have been poor. The big signals we used to expect from the west coast of America are way down on previous years, although on odd occasions we do get a good opening for a couple of hours or so, then for the next few days virtually nothing is heard or workable.

Everyone appears to notice the once-reliable DX path to New Zealand is also suffering from the overall decline in propagation. Most times the openings are reasonable, but not the once five by nine plus signals we used to enjoy and take for granted only a year or so back. Likewise, the big signals once heard from New Caledonia have also been chopped back to size by mother nature too, which also indicates a big decline in conditions.

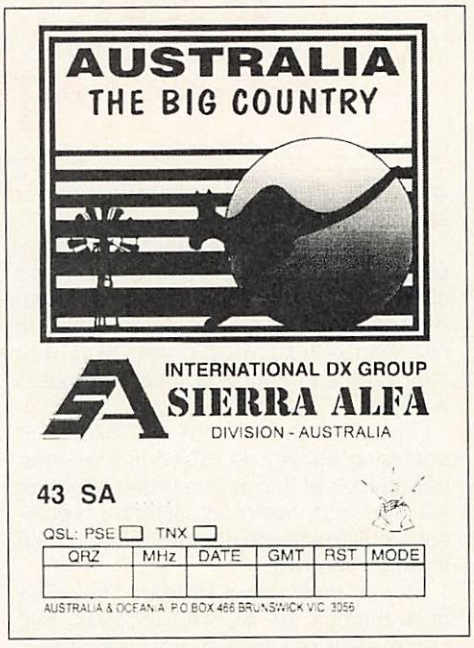
Hawaii is a reliable regular on the band. I received a letter from a young Adelaide DXer who worked a 'weird' DXpedition from Hawaii and needs more information. Well, young Michael, the DXpedition you worked was a strange one indeed. I listened into it for near an hour and learned as follows: The 17-SD-0 DXpedition was operated by Joe in celebration of being the first Hawaiian member of Sierra Delta group. Joe was using an AR-3500 at the time, fed to a six-element Yagi. To QSL you have to send one American dollar or two IRCs to: Mr Helio, 34-AT-178, PO Box 96, Tenerife 38080, Canary Islands, Spain.

Papua New Guinea is quite active on the band with old regular and long-time resident 'Doc' being logged at 1031z with a five by three report. Also heard the other day two stations connected with mopping up operations in volcano-damaged Rabaul chatting on a rather quiet 27.195MHz, one of the channels left over from the 18-channel fiasco. These gentlemen were loud and clear, despite the fact they were using AM mode at the time!

Guam was logged at 0355z by way of 62-RB-101, operated by Mac with a good steady five by seven report from Agana — not bad considering just 10 watts into a two-element cubical quad was all the station comprised. Ron, the 62-ON-106 is also active and at the earlier time of 0325z reported as a fair four by five report.

Central Kiribati (265) is still a most sought-after country by many and I was most surprised to hear UNIT-202, name unknown, operating supposedly from Canton Island at 0400z. The station concerned was on a sked with someone I couldn't hear in New Zealand, and was five by two at the time. Could be a slim, or maybe not, so work first, worry later. I heard him way high on the band, and I mean *high*, which suggests they were after privacy.

Eastern Kiribati (266) is usually about the band, and at 0210z I noted Kel, the 606, operating from Kiritimati Island (Christmas Island in English) chatting to a station in Surfers Paradise. Kel was five by seven and using a Superstar radio into a groundplane antenna. Kel did not seem too interested in QSLing.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Tuvalu (276) surprised me in early January with a good five by six signal on channel 24 on the AM mode amongst all the interstate DX bleeding through from SSB. I couldn't get the operator's name, but he is located in Vaiaku on Funafuti atoll and was talking to a station in Western Kiribati at the time in broken English.

The **Marshall Islands** were a good five by eight at 0100z by way of Red, who signs as the KKC-264 from the American military base on Kwajalein atoll. Red was looking for a mate in Hawaii and constantly ignored calls directed to him from numerous Australian stations at the time.

Belau, also known as **Palau**, (244) has been noted at 0220z with Joel operating as BASE RADIO looking for his brother on a small fishing vessel. Joel is not interested in DXing, he told a Tasmanian station he was working at the time, but said that he was located in Koror, the capital of the small island republic. Joel was a good five by five at the time.

Western Samoa was found on that illustrious 27.195 MHz left over from the 18-channel era, where two gentlemen were chatting on the FM mode at 0110z in Samoan. One was located in Apia, the capital, whilst the other's location was unknown, possibly in New Zealand. Despite being on FM, the Samoan station was a good five by four to five here.

Tonga appeared on 11 metres by way of Kathy and her husband Mitch aboard the ocean going yacht VANITY, and at 0045z were a reasonable five by three on channel 40 upper. Anchored in Vava'u Harbor, they were looking for a New Zealand station with information on the Bay of Plenty area. The VANITY was due to leave Vava'u on February 5 for New Zealand.

Norfolk Island is more common down on the 40-channel range than up on the high channels, and just the other day I heard John, callsign not known, chatting from his car parked at Norfolk Island airport to his mate in Canberra on 15 lower. John was five by seven at 0311z. Kevin, the 130-UNIT-278, was logged much later at 0505z on 13 lower with a poor two by three report.

The **Philippines** was logged at 0612z with a station signing a DXpedition callsign, 79-DU-0 operated by a chap called Hector. The location given was Lopez, 236 kilometres south of Manila, but no other details are known. Hector was five by six at the time.

St Pierre and Miquelon Islands (141) were reported as active in early January by way of a station signing as JPL-1, name unknown. I heard the said station at 2256z, but it was barely readable here although I believe one or two New Zealanders possibly made it through for a good contact despite deplorable propagation at the time.

All's well that ends well, they say, and although conditions are very poor there *is* DX about, and it *can* be worked with some patience, along with a good quad or beam pointed in the right direction. Special thanks to those who wrote in with news and views.

Good hunting in 1995! A stamped, self-addressed envelope must be furnished for personal reply via PO Box 299, Ryde, NSW 2112.

73 de Jack.

AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

Concern: Business operators taking over CB frequencies

Some recent correspondence took up a lot of time at the ACBRO committee meeting last December. A member wrote to express his concern that several business organisations in his area were simply taking over the CB channels on UHF. The member, from Cessnock in NSW, made reference to happenings in or near to his area and in Newcastle, which is not far away.

He complained that many businesses, including a state government authority, and one of Australia's largest corporations — BHP — had 'attached themselves' to particular CB channels for various means of communications.

The member's lengthy letter, which was analysed by the committee, basically appeared to be a complaint of business people using the allocated frequencies of the CBRS for business purposes, and hinted at their desire to retain certain channels for their exclusive use. While it is perfectly legal for businesses to use the CBRS for business traffic, it's clearly *not* acceptable for any operator or organisation to claim sole use of a CB frequency.

Whilst his letter did not ask it outright, we were wondering if our correspondent wished ACBRO to lobby for the complete exclusion of business activity on the CBRS bands. We sent a response to him, in which we asked several further questions, and this may clarify the position.

However, ACBRO, in looking at the member's concern, had to take into account the documented reasons for the CBRS being made available to the general community. Looking at the SMA's published information paper (14C) on the CBRS, citizens and those occupying a business activity are *not* discriminated against.

In part, SMA's information says "...the CBRS is a two-way short distance voice communications service that can be used by any person in Australia. The service may be used for virtually any form of personal voice communication activity, whether it is recreational, domestic, or in connection with work or business."

So while there has been no request upon ACBRO to create a lobby to change the present arrangements, it can be assumed that CBers have learned to live with other CB operators who use their radios in connection with business activities.

The Committee of ACBRO, in analysing the issues raised in the letter, had to look at things in a broad sense of fair play and, above all, with the regulations governing the use of the band held foremost in mind.

It was interesting to learn, in going back through the ACBRO archives, that in the early regulations set up for users of the CBRS, a fee discrimination was established. In this, a higher licence fee was charged to users who nominated at the time of their application that they planned to use their CB radios for business communications. I seem to recall that inquiries made at the time by ACBRO, showed that there was a grey area in determining what constituted a business communication.

The vague answer at the time indicated that if any profit (financial) was made from the use of the transmission, even if only once during the year's term of license, the higher 'business' fee would have to be paid. Ultimately, of course, sanity prevailed in this area, and a single license fee was established for *all* users. So for the moment at least, those who would refer to themselves CBers will have to live together on the bands with those sharing its use for business purposes.

By the same token, those forming the latter group must know or be taught that they have to *share* the service with those who fit into the CBer group. And only tolerance and understanding will permit this union to coexist sharing the one commodity.

It is hoped that, where there is need, that any exchanges between parties from either camp in establishing this form of education can be negotiated sensibly and politely to the benefit of all of the users of the CBRS.

Meanwhile, the committee will keep this matter on its agenda for further consideration as need dictates. And yes, this matter is not exclusive to the Newcastle area. In fact, it exists in most capital and provincial cities around Australia.

Business and repeaters...

The comprehensive list of CBRS repeater stations around Australia published here in CBA, would probably be much smaller were it not for the business community's participation, both active and financial. In fact, it's now possible that channel saturation has occurred in some areas, with no further allocations for CBRS repeaters being available for new licensees.

But many of the repeaters in some areas were established with a great input from the business community. Even so, it should be made quite clear that no one business or repeater licensee has any exclusive right of use of such repeaters, as their licensing conditions provide that use shall be for all without exclusion.

And equally so, no operator may claim the right to dominate use of a repeater to the exclusion of others. Putting this into practice of course requires the unknown quantity — common sense — which may sometimes appear to be a rare commodity in CB land. It is something that can only be emphasised to those who are uninitiated — fair play on the repeater channels.

Breakers should be heard and acknowledged, and given a fair go... but likewise, breakers should learn to be courteous if given the opportunity to break in. They should state the cause of interrupting a conversation if necessary. By all means accept any courtesy given, but don't take over the channel from others who have extended the courtesy to you.

The setting up of a repeater station in accordance with the licensing conditions is an expensive operation, and CBers should at all times be conscious of this commitment by others for their benefit. But the *sharing* of the facility provided must be paramount in the minds of the users, even if they're the users who supplied the service, sometimes referred to as the proprietor of the repeater.

Let's take an example: let's say a country taxi firm with a small fleet of vehicles decided to set up a repeater service (and was given license to so do), the taxi company would clearly be able to benefit financially by using the service to control the fleet operation, adding to its efficiency and attracting new patrons.

The business use of the repeater would only be as good as that which was available to *all* users, though, as anybody would legally be able to use the repeater. The taxi company would not be able to claim any exclusive or even preferential service for its radio traffic, and could only expect to make calls when the repeater was busy by using the traditional 'breaker' method. Hopefully, taxi calls would enjoy the courtesy of other users, who hopefully would have been trained in this sharing vain.

ACBRO can only encourage sensible and courteous operation through mention in pages such as these, or through its own publication to members (which, regrettably is only 'preaching to the converted'!).

To the business people using the CBRS as citizens of Australia, particularly those who have helped and contributed to its establishment, you are acknowledged by ACBRO, but you're asked to conform with the simple rules and self-regulation to which *all* of us, not just the CBers, have to abide.

And of course, the CBers who may form the majority users of the band should also remember that it is a two-way street. After all, the regulations don't discriminate between the people of this country...

ACBRO, as a repeater licensee in Adelaide, shares in providing this form of community service, and shows no discrimination of users (despite the selfish operation displayed at times by some).

Repeater List

Thanks to the many callers and letter-writers relating to the input and output channel confusion shown in recent issues of the Repeater List. Unless the gremlins have found their way back into the system, the corrections will have been made by now, and you shouldn't see *that* happen again!

ACBRO ASSOCIATED CLUBS

Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership. Full details can be obtained by contacting the group of your choice from below.

For membership or affiliation enquiries please contact:
ACBRO Inc., P.O. Box 170, Walkerville 5081, South Australia.

Cleveland Bay Radio Club	P.O. Box 1641, Aitkenvale,QLD 4814
SA Rotten Radio UHF Assoc.	P.O. Box 4, Dry Creek,SA 5094
LT Club Inc.	P.O. Box 626, Launceston,TAS 7250
Radio City Australia	26 Wootten St. Greenacres SA 5086
Pioneer Radio Association (SA)	P.O. Box 1017 Salisbury, SA 5108
Plantaganet Rep't Institute of WA	PMB 306, Cranbrook, WA 6321
Burnie Citizens Radio Club	P.O. Box 655, Burnie, TAS, 7320
Transworld CB Radio Club	90 Crozier Avenue, Daw Park SA 5041
Canning River Radio Club	53 Parkside Ave, Mt. Pleasant WA 6153
Overland Radio Club	P.O. Box 1010, Murray Bridge, SA 5253
Eureka CB Radio Club	P.O. Box 27, Reynella, SA 5161
Transworld Sidebanders (The X/Ray Club)	13 First Street, Port Pirie, SA 5540
Echo Romeo CB Assoc.	P.O. Box 302, Morphett Vale SA 5162
Rotten Radio Group Intnl	P.O. Box 4, Dry Creek SA 5094
Broken Hill UHF Repeater Club Inc.	P.O. Box 1023, Broken Hill NSW 2880
Gippsland Repeater Assoc. Inc.	P.O. Box 555, Maffra, VIC 3860
Murray Bridge Agric & Hort Society	P.O. Box 315, Murray Br., SA 5253
Samba Club	P.O. Box 16, Salisbury, SA 5108
Tweed Radio DX Group Intnl	P.O. Box 773, Murwillumbah, NSW 2484
The Pathfinder Radio Soc. Club	P.O. Box 24, Woodridge, QLD. 4114
Dirty Dozen Radio Group	P.O. Box 426, Morphett Vale, SA 5162
Hotel Zulu Radio Group Inc.	P.O. Box 66, Elizabeth, SA 5112
White Fox Radio club	P.O. Box 288, Salisbury, SA 5108
Mega Mouth International	P.O. Box 55, Mowbray, Launceston, TAS 7250
The Triple "R's" Group	451 Regency Road, Sefton Park, SA 5083
Tru Blue Radio Group	P.O. Box 379, Blackwater, QLD. 4717
Sugar Valley Radio Club	9 Martin Place, Edgeworth, NSW 2285
Blue O Radio Group	P.O. Box 53, Monaro Cresc, ACT 2603
Sydney Radio Group	P.O. Box 185, Gordon, NSW 2072
Ratbag CB Radio club	P.O. Box 227, Welland, SA 5007
Sun Centre CB Radio Club	P.O. Box 912, Swan Hill, VIC 3585
Port Adelaide Radio Club	P.O. Box 352, Pt. Adelaide, SA 5015
Cherokee Indian Aust. Group	P.O. Box 1679, Mildura, VIC 3500
Sth. West District CB Radio Club	P.O. Box 620, Warrnambool, VIC 3280
A.M.O.S. CB Radio Club Intnl	P.O. Box 351, Broken Hill, NSW 2880
Pioneer Radio Association Aust.	P.O. Box 1415, Mount Isa, QLD 4827
Naracoorte UHF Association	P.O. Box 465, Naracoorte, SA 5271
Gosford Radio Club	50 Pacific Highway, West Gosford, NSW 2250
Ultra-Lite Radio Club Inc.	P.O. Box 17, Strathpine, QLD 4500
Felix Radio Club	P.O. Box 78, Goodna, QLD 4300
Inlander CB Radio Club	P.O. Box 5712, Rockhampton, QLD 4702
Aust. Red-Heeler Soc. Radio Club	P.O. Box 8018, Wynnum North, QLD 4178
Central West CB Radio Club Inc.	P.O. Box 628, Orange, NSW 2800
Vic Red Heeler Radio & DX Group	P.O. Box 1802, Ballarat, VIC 3354.
Kilo Romeo Circle of Friends	P.O. Box 16, Cleveland, QLD 4163
Radio Hobart Group	P.O. Box 266, Glenorchy, TAS 7010.
Welsh Dragon Radio Club	P.O. Box 581, Belmont, VIC 3216
Oscar Romeo CB Club	P.O. Box 203, North Geelong, VIC 3215
Coal Miners Wonthaggi CB Club	P.O. Box 420, Wonthaggi, VIC 3995
East Coast Radio Club	P.O. Box 412, Bexley, NSW 2207
MBV 08 Repeater Assoc.	c/o Post Office, Charleston, SA 5244
Q'land Radio DX International Club	P.O. Box 586, Warwick, QLD 4370
Q'land Blue Heeler Soc. Radio Club	P.O. Box 1122, Castle Hill, NSW 2154
The 43 Australian Radio DX Club	P.O. Box 96, South Oakleigh, VIC 3167
Sugar Valley Radio Club	P.O. Box 1070, Edgeworth, NSW 2285
Ozzy Eagle DX Group	P.O. Box W110, Armidale, NSW 2350
Home Brew Makers CB Radio Club	1 Lexen Court, Hattonvale, QLD 4341
International Black Duck DX Group	1 Lexen Court, Hattonvale, QLD 4341
Ozzie Radio DX Group	P.O. Box 683, Bairnsdale, VIC 3975
Aust. Nat. Four Wheel Drive Council	P.O. Box 79, Canberra, ACT 2601
The UHF Assoc. of Western Australia	P.O. Box 316, Cloverdale, WA 6105
Geelong Radio CB Club of Australia	P.O. Box 736, Belmont, VIC 3216

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CB UHF REPEATER LIST

NEW SOUTH WALES

Callsign	Town/Locality
	CHANNEL 1
BEL01	Belbora
BHI01	Broken Hill
BIN01	Bingara
BOB01	Harden
BRE01	Brewarrina
BRH01	near Broken Hill
BUN1	near Merriwa
CHT01	Charlestown
COR01	Corowa
DNQ01	Deniliquin
GRE01	Grenfell
GUY01	Guyra
JIN01	near Jindabyne
KGL01	Kyogle
MBI01	Moonbi
MRT01	Wilcannia
MTE01	Mt Eagle
NEE01	Dubbo
NIM01	Nimmitabel
NYN01	Nyngan
RYL01	Rylestone
SYD01	Sydney
ULA01	Ulladulla
WAG01	Wagga
WGT01	Walgett
	CHANNEL 2
BER02	near Gloucester
BRH02	Broken Hill
CAN02	Cangai - West of Grafton
EDN02	Bega / Eden
GDH02	Gunnedah
INV02	Inverell
KHN02	Khancoban
KOS02	near Thredbo
KUR02	Sydney - Blacktown
LGW02	Mt Lambie
LIS02	near Byron Bay
MAC02	Port Macquarie
NBR02	Wee Waa / Narrabri
NOW02	Nowra
PAR02	Parkes
WAL02	Walcha
WAN02	Wanaaring
WBD02	Walbundrie
VRB02	Urbenville
	CHANNEL 3
CAN03	near Orange
CAS03	Casino
COM03	Mt Kophi
DUN03	Dungog
GIL03	Braidwood
GTH03	Griffith
MDI03	Murrurundi
MNA03	Manilla
MOR03	Moree
MTI03	Tubramurra Shire
PLO03	East of Armidale
RWT03	Hay
SYD03	Sydney
TEN03	Tenterfield
	CHANNEL 4
ALB04	Albury
ARM04	Armidale
CBN04	Coonabarabran
DRK04	Girard
GLB04	Goulburn
HAY04	Hay
MON04	Kandos - near Mudgee
MUS04	Muswellbrook
OGU04	Ogunbi - near Tamworth
RIV04	Penrith Area
SOU04	near Cooma
THA04	near Broken Hill
TUL04	Tullibigeal
TWH04	Banora Point
WAN04	Mt Wandera
WAR04	Warialda
YNG04	Young
	CHANNEL 5
	EMERGENCY REPEATERS
BIN05	**Katoomba**
BKE05	**Mt Gunderbooka**
CAP05	**near Tenterfield**
CHN05	**Charlestown**
COR05	**Corowa**
FOR05	**Mount Tallabung**
FRA05	**Bellingen**
GLB05	**Goulburn**
JIN05	**Jindabyne**
MTS05	**Narromine**
MTU05	**S-West Slopes, East River**
OXY05	**Bourke**
SYD05	**Sydney**
TAM05	**Tamworth**
TBO05	**Mt Talbingo**
	CHANNEL 6
BAR06	near Narrabri
BON06	Bonshaw - Q/NSW border
COF06	Coffs Harbour
COL06	Oakey
GGG06	Glengary
LGW06	Lithgow
MAL06	Mallanganee
MTG06	Bowral
MUM06	Mumbulla Mountain
NAR06	Narromine
NEW06	Sugarloaf Range
ROB06	Mt Robert
TUM06	SnowyMountains
WAL06	Walcha
WEN06	Tolarno
	CHANNEL 7
BAL07	Buckombil Hill
BOM07	Bombala
BO007	Booral - near Bulahdelah
COW07	Cowra
GLH07	Glen Lyon
GLI07	Glen Innes
MIL07	Milton
NUN07	Nundle - near Tamworth
SYD07	Sydney
WAL07	East of Walcha
	CHANNEL 8
BAT08	Bathurst
COB08	Cobar
CON08	Condobolin
EUC08	near Eucumbene
GLE08	Glen Innes
GRE08	Gresford - near Dungog
GRF08	near Grafton
KEM08	Kempsey
MER08	near Merimbula
MUR08	Tomewin
NAR08	Narrandera
ROB08	Illawarra
TBC08	Tooleybuc
URA08	Uralla - near Armidale
WAL08	Walcha
WOY08	Kariong

NORTHERN TERRITORY

Callsign	Town/Locality
	CHANNEL 1
ALS01	85 KM SE of Alice Springs
BPK01	90 KM N of Alice Springs
DRW01	Darwin
KVB01	Double Hill
MLG01	Milingimbi
	CHANNEL 2
ALC02	115 KM NE of Alice Springs
DDB02	Garibaldi Station
SWN02	150 KM NNE of Alice Springs
	CHANNEL 3
ELK03	325 KM NE of Alice Springs
ERL03	185 KM SSW of Alice Springs
MMI03	Mistake Creek Station
	CHANNEL 4
DPW04	70 KM S of Alice Springs
MST04	110 KM S of Alice Springs
	CHANNEL 5
	None assigned
	CHANNEL 6
HEN06	120 KM SW of Alice Springs
	CHANNEL 7
AMB07	85 KM SE of Alice Springs
ASP07	Alice Springs
	CHANNEL 8
	None assigned

The following channels are the input channels for a repeater:

IN	Frequency (MHz)	
31	477.175	
32	477.200	
33	477.225	
34	477.250	
35	477.275	** for emergency use only
36	477.300	
37	477.325	
38	477.350	

The output channels are listed below:

OUT	Frequency (MHZ)	
1	476.425	
2	476.450	
3	476.475	
4	476.500	
5	476.525	** for emergency use only
6	476.550	
7	476.575	
8	476.600	

QUEENSLAND

Callsign	Town/Locality
	CHANNEL 1
ANN01	St Annes Range
BAR01	near Barcaldine
BAT01	Bathurst Heads
BNE01	Mt Cotton
DEL01	Collinsville
HAN01	Hannaford
HUG01	Hughenden
ING01	Inglewood
INN01	Innisfail
MDT01	Middlemount
MOR01	Mt Hope
OWN01	Mt Oweenee
RKY01	Mt Archer
ROM01	Mt Bassett
SPC01	Windorah
TSV01	Townsville
TTH01	Twin Hills
WBB01	Mt Perry
WCT01	Charters Towers
	CHANNEL 2
GLD02	Gladstone
GLN02	Glenden
ING02	Mt Cordelia
JCK02	Julia Creek
LAU02	Laura
MAB02	Broadsound Range
MIN02	Glenlyon Dam
POR02	Drummond Range
SPC02	Bowen
TAM02	Tambo
TAR02	Taroom
TRN02	Quilpie
TWB02	Mt Kynoch
WAG02	Aranyi South
WAV02	Wavell Heights
WBR02	Mt Kanigan
WON02	Cogango Range
	CHANNEL 3
ABC03	Gold Coast
CHI03	Chinchilla
CTS03	Charters Towers
INK03	Mt Inkerman
KIL03	Kilcoy
LAI03	Mt Beau Brummell
MBO03	Tinana
MTO03	Monto
MTW03	Mt William
PCC03	Edward River
SPR03	Springsure
VHO3	Mt Isa
	CHANNEL 4
BBG04	Sloping Hummock
DIP04	Double Island Point
EID04	Eidsvold
GDI04	Goondiwindi
HOP04	Rockhampton
IPS04	Ipswich
JER04	Jericho
MBH04	Moranbah
MOW04	Darling Downs
TSV04	Townsville
VHN4	Expedition Range
VHW4	Cannonvale
	CHANNEL 5
	EMERGENCY REPEATERS
ABC05	**Springbrook**
BNE05	**Mt Glorious**
CEM05	**Clermont**
FSB05	**Mt Goonaneman**
GEM05	**MtWolvi**
ING05	**Mt Cordelia**
MIL05	**Commodore Peak**
QBM05	**Darling Downs**

VHN05	**Charters Towers**
VHP05	**Biloela**
	CHANNEL 6
BLK06	Blackdown Tablelands
BRA06	Sea View Range
CBT06	Mundubbera
CHT06	Mt Janet
CLE06	Police Mtn
CNE06	Bergen
DIM06	Mt North Iron
GLD06	Mt Larcom
MIL06	Palardo Hill
MKY06	Gympie / Mackay
PRR06	Clermont
RIC06	Yan Yean
TAM06	Tambo
THG06	Thargomindah
VHN06	Wilkes Knob
	CHANNEL 7
BIL07	Banana Range
BNE07	Toohey Mtn
CTR07	Towers Hill
DMD07	Clermont
ESK07	Esk
GEM07	Gympie
IND07	Fraser Island
ING07	Mt Mercer
MUR07	Mt England
VHO7	Mt Hutton
WBB07	Mt Watalgan
WRA07	Warwick
YKA07	Mt Slowcombe
	CHANNEL 8
AMI08	Amiens
AMP08	Monto
BAL08	Noondoo
BLL08	Blackall
CHN08	Mt Peanga
CHT08	Charters Towers
EMD08	Emerald
HBY08	Ghost Hill
MBR08	Mt Brisbane
NEB08	Nebo
ONV08	Ocean View
TLD08	Atherton
VHN08	Barkly Down

SOUTH AUSTRALIA

Callsign	Town/Locality
	CHANNEL 1
CDA01	Ceduna
MJN01	Oodnadatta
MTR01	Leigh Creek
PRC01	Carrieton (Nth of Orroroo)
PAR01	Adelaide (North)
TYN01	Oodnadatta
VLA3	Crystal Brook
	CHANNEL 2
BOR02	Bordertown
BRP02	Orroroo
CLV02	Cleve
MYP02	Myponga
VLA4	Kingoonya
	CHANNEL 3
ADL03	Adelaide (Central)
ALN03	Yunta
BLN03	Blinman, Flinders Ranges
CTR03	Moonta
KBY03	Port Elliot
UNO03	Port Augusta
	CHANNEL 4
BLF04	Port Pirie
BAR04	Nuriootpa
KOK04	Lake Gairdner West
NAR04	Lucindale
PKI04	Kangaroo Island
	Leigh Creek (North East of)
	CHANNEL 5
	EMERGENCY REPEATERS
ADL05	**Adelaide suburb**
BEE05	**Crystal Brook**
EUD05	**Eudunda**
MNT05	**west of Woomera**
MTG05	**Penola/Mt Gambier**
	CHANNEL 6
LST06	Elliston (Eyre Peninsula)
NON06	120 Km West of PtAugusta
REN06	Renmark
SNO06	Snowtown (nearPt Pirie)
TIN06	Coonalpyn
WKI06	Kangaroo Island
WLG06	Tarcoola
WLP06	Willpena
	CHANNEL 7
CLR07	Clare
MTG07	MtGambier
MUT07	south of Cockburn
UNO07	Kyancutta
VLA7	Streaky Bay
WIL07	Hawker
YKP07	Warooka
	CHANNEL 8
BRYY08	Burra
MBV08	Murray Bridge
MTA08	Quorn
PTL08	Tumby Bay/Port Lincoln
SW)	Oodnadatta (200 KM
	Yalata (187 Km N/W of Ceduna)

TASMANIA

Callsign	Town/Locality
	CHANNEL 1
DEV01	Devonport
FIS01	Flinders Island
SET01	Grasstree Hill
	CHANNEL 2
CHN02	Herring Back
LCN02	Launceston
TWC02	Mt Read
	CHANNEL 3
NEC03	Ben Lomond
	CHANNEL 4
MID04	Millers Bluff
	CHANNEL 5
	EMERGENCY REPEATERS
HBT05	**Hobart**
LTE05	**Fingerpost Hill**
	CHANNEL 6
REC06	Mt Paul
VJA6	Mt Lloyd
WCT06	St Valentines Peak
	CHANNEL 7
CHT07	Barren Tier
TNE07	Mt Victoria
	CHANNEL 8
BRN08	Burnie
TBL08	Table Mountain
TNE08	St Marys

VICTORIA

Callsign	Town/Locality
	CHANNEL 1
ALX01	Eildon
APS01	Apsley
MEL01	Melboume
OME01	near Omeo
ROU01	Penshurst
STA01	St Arnaud
WAL01	Walhalla
	CHANNEL 2
BAL02	Ballarat
KER02	Mt Kerang
MAN02	Mansfield
MOE02	Moe
PYA02	Pyalong
	CHANNEL 3
ABE03	South
DEL03	Bombala
HOR03	Horsham
FAL03	Falls Creek
JNR03	near Dartmoor
WBT03	Mt Wombat
WPH03	Weeaproinah
YLA03	Yelta
	CHANNEL 4
ANA04	Mt Anakie
ARA04	Ararat
BEN04	Bendigo
CRJ04	Traralgon
HAW04	Hawkesdale
MCA04	Marambingo Hill
	CHANNEL 5
	EMERGENCY REPEATERS
BAL05	**near Ballarat**
MAN05	**Mansfield**
MEL05	**Melboume**
RFY05	**Ruffy**
	CHANNEL 6
FOS06	Mt Fatigue
HLV06	Healesville
ECH06	Echuca
BRN06	Mt Concorde
MSS06	Mt Seldom Seen
SWH06	Swan Hill
WAN06	Wangandry
WIL06	Mt William
	CHANNEL 7
BOL07	Mt Bolton
BND07	near Bendigo
MEL07	Melbourne
MOR07	Mt Shadwell
MVL07	Mt Gordon
SHP07	Shepparton
TAL07	Mt Granya
	CHANNEL 8
ART08	Safety Beach
DUN08	Cavendish
HAR08	Mt Alexander
MCN08	Mt Cann
MYR08	Mt Porepunkah
TER08	Mt Terrible

WESTERN AUSTRALIA

Callsign	Town/Locality
	CHANNEL 1
COL01	Collie
DEN01	Denmark
GER01	Geraldton
KAM01	Kambalda
KAT01	Katanning
KLB01	Kellerberrin
LEN01	Leonora
MIA01	Mia Mia Station
MKT01	Poison Hills
PER01	Perth
WAR01	Warakuma
WIK01	Wickham
	CHANNEL 2
BIN02	Bindoon
BUN02	Near Bunbury
CAR02	Carnamah
KAL02	Mt Charlotte
LYN02	Lyndon Station
MRD02	Merredin
VLN5	Mt McLure
WLP02	Walpole
	CHANNEL 3
ALB03	Albany
CLA03	near Carlotta
NOR03	Nannup
PER03	Roleystone
VET03	near Bardoc
	CHANNEL 4
BYB04	Dinninup
ESP04	Esperance
GNG04	Lancelin
KUL04	Kulin
MTB04	Cranbrook
NEW04	Newman
	CHANNEL 5
	EMERGENCY REPEATERS
PER05	**Orange Grove**
MTR05	**Mt Barker**
VLN6	**Perth**
	CHANNEL 6
DAR06	Darkan
JUR06	Mt Lesueur
MGR06	near Margaret River
MNP06	Albany
MTS06	Mt Solus
VKM06	Wyalkatchem
	CHANNEL 7
BDG07	Bridgetown
C0007	Coolgardie
MGR07	Augusta
MTB07	Stirling Ranges
PIN07	Pinjarra East
VRK07	Mt Bakewell
	CHANNEL 8
MAN08	West Manjimup
MSA08	Mt Saddleback
PER08	Kalamunda
QUN08	Quinorlup
RVT08	Ravensthorpe

A.C.T.

Callsign	Town/Locality
	CHANNEL 1
CBA01	Canberra (Portable)
	CHANNEL 2
CBA02	Isaacs Ridge
	CHANNEL 7
GIN07	Mt Ginini
	CHANNEL 8
CBA08	Isaacs Rid

REPEATER UPDATE

To maintain the UHF repeater list in an up-to-date manner requires the co-operation of repeater owners and local users. Please ensure that when an error is found, or an update is required, that you contact:

Trevor Colwell, ACBRO Inc.,
PO Box 170,
Walkerville 5081, South Australia

who will ensure that this information is included in the next repeater list.

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